TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

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UNDULANT AND ABORTUS FEVERS.

AUCHÉ (Bernard). **Etiologie, pathogénie, et prophylaxie de la fièvre ondulante.**—*Ann. d'Hygiène Publique Indust. et Sociale.* 1925. Mar. Vol. 3. New Ser. No. 3. pp. 137–176.

The author gives an exhaustive resumé of our recent knowledge of the etiology, pathology and prevention of undulant fever. He describes very fully the alarming increase in its endemic areas particularly as affecting France, and gives a statistical table; 952 cases were recorded from 1920–1924 in France, 585 confirmed by laboratory methods. Up to May in 1924, there were no less than 338 cases, and it is likely, he states, that this is only about a third of the real number. Reviewing the controversy as to the unity of *M. melitensis* and *B. abortus* he agrees with BURNET that it is difficult, if not impossible, to separate them bacteriologically, but one is adapted for growth in goats and man, the other for cattle, though abortus possesses a great virulence for pigs. He thinks that the arguments of CREPIN (*ante*, p. 114) as to the *non*-infection of goats and sheep with melitensis are not sound, and he considers these animals to be the chief agents in its distribution.

The epidemiological section is well worth careful reading; the propagation of the disease by goats, sheep and other domestic animals, including the cat, and sometimes from man to man, is clearly stated. All the south of France has been already invaded and the rest of France is threatened. Prophylactic measures require to be rigorously enforced, as at present they are not effective. These are given in detail for man and animals, and include vaccination with abortus if further test with this organism should be satisfactory. The paper should be read in the original, as it gives, particularly from the French point of view, full information.

P. W. Bassett-Smith.

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BURNET. **Les récentes acquisitions sur la fièvre méditerranéenne.**—*Bruxelles Méd.* 1925. Mar. 8. Vol. 5. No. 19. pp. 630–634.

The author points out that the extension of undulant fever from the coast inland is a very disturbing epidemiological factor. The disease has many analogies with tuberculosis, and the intra-dermal reaction of "melitine" like that of "tuberculin" is specific. He looks upon the two microbes (*melitensis* and *abortus*) as a single species differing only in pathogenicity, the latter being called *melitensis abortus ;* though he states that no one has ever been able to convert the one into the other, and he has never known abortus to give rise to fever in man, though in very large doses it can infect monkeys. NICOLLE and CONSEIL have shown that it is possible to produce a prophylactic vaccine against undulant fever in man, but the author has not been able to immunize guineapigs against either melitensis or abortus. The extension of the disease necessitates increased hygienic precautions, chiefly the sterilization of milk before use, and the extinction of the disease in all animal carriers by vaccination, for which the abortus organism should be used ; in fact, this organism, being less dangerous and giving rise to similar serum reactions, is recommended for all prophylactic and therapeutic uses.

P. W. B-S.

CLEARKIN (P. A.). **A Review of the Recent Literature on Undulant Fever of Man and Contagious Abortion in Animals.**—*Kenya Med Jl.* 1925. Feb. Vol. 1. No. 11. pp. 337–341.

It is stated that *B. abortus* has been recognized in Kenya for many years, but the first case of undulant fever was found only three years ago. Thirty-one cases have now been recorded in the Colony, and many others have been suspected. Some of the early cases were definitely associated with drinking goat's milk ; in this colony therefore the goat is certainly incriminated. Great numbers drink unboiled cow's milk, but only one European has been known to develop undulant fever, and though the abortus disease is very common in cattle, no patient has been known to have had any connexion with cattle suffering from that disease. The author concludes that the case against cows causing infection with undulant fever is not strong, but it is a possible danger, and the moral is, "boil all milk."

P. W. B-S.

DUNCAN (J. T.). **The Rôle of the Domestic Cow in the Epidemiology of Undulant Fever.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Nov. 20 & Dec. 11. Vol. 18. No. 5 & 6. pp. 318–327. With 2 figs. [22 refs.]

This is a very careful and interesting paper relating to undulant fever in South Africa. Very few cases have so far been recorded of human infections by *B. abortus*. The author describes a case of Rhodesian undulant fever treated in the Tropical Diseases Hospital, London, and gives details of the laboratory investigations made there. The patient, a butcher, had been resident in Southern Rhodesia for 15 years. The disease was apparently contracted from cow's milk. Six months after the onset, the author isolated from the blood an organism indistinguishable morphologically and culturally from *M. melitensis*, but absorption tests showed it to be more closely allied to

the abortus strains than to the melitensis ones tested. Many agglutination tests were made with different strains, and the author believes that the present evidence points to *B. abortus* as the cause of the disease both in cattle and man in Rhodesia, but there is as yet no trustworthy test which can distinguish the two organisms. Cultures of three strains of *B. abortus*, the isolated human strain B., and some of *M. melitensis* strains treated with lacrymal secretion gave no evidence of lytic action, and inconclusive results with certain soluble salts of organic acids which have been found valuable in differentiating organisms of the Salmonella group. On all culture media used, the growth of *B. abortus* and the isolated strain B. was more luxuriant than that of *M. melitensis* but was not diagnostic. The infection of Rhodesian cattle requires careful observation, and measures to prevent its spread from the endemic centres, since it must be looked upon as a danger to the human population ; more experimental proof is required to show whether the bovine infection is really pathogenic to man.

P. W. B-S.

i. FICAI (Giuseppe) & ALESSANDRINI (Alessandro). **Setticemia da "*Bacillus abortus*" (Bang) nell' uomo.**—*Policlinico.* Sez. Prat. 1925. Jan. 26. Vol. 32. No. 4. pp. 113–115.

ii. —— & ——. **La setticemia da "*Bacillus abortus*" (Bang) nell' uomo.**—*Ann. d'Igiene.* 1925. Jan. Vol. 35. No. 1. pp. 1–64. [68 refs.]

i. An interesting and suggestive paper, the subject matter of which, if confirmed, will help to clear up the distinction between infections by *M. melitensis* and Bang's bacillus. Two instances are recorded in which several persons in a district where goat's milk is not taken were attacked by fever resembling undulant fever after they had attended an aborting cow. The authors were able to isolate the *B. abortus* from the blood of two of the patients during the febrile period.

By the following technique the two diseases can be serologically differentiated. The serum before being inactivated should be diluted 1 in 50 with distilled water instead of saline, but after inactivation the subsequent dilutions are made with 0·9 per cent. NaCl. True anti-melitensis sera, after heating to 60° C. for half an hour, will agglutinate, but not if heated to 65° C., while "anti-Bang" sera agglutinate after being heated to the latter temperature and even to 70° C., but no longer do so if heated to 75° C.

ii. This long article may be regarded as an amplification of i. It is divided into 8 sections. The first reviews the present opinions generally held relative to undulant fever, and states that the disease transmitted to man from a sick cow, especially one which has aborted, is not a "melitensis" but an "abortus" septicaemia, and that the authors have definitely isolated the *B. abortus* from man. In the second the epidemiology and the distribution of the two diseases are dealt with, references being quoted in support of their statements and showing that the infection occurs with greater frequency in spring when abortion in cows is more common. The third section is devoted to showing that the prevailing idea that the two organisms are by serological tests identical is erroneous, and that by special methods the agglutination test may be employed to distinguish between them. The serum of a patient infected with *B. abortus* will resist, after dilution first with distilled water and later with saline [see above], a temperature

of 75° C. for half an hour, whereas that from a case of *M. melitensis* infection loses its agglutinating power if heated to 65° C.; in other words, the anti-abortus serum is thermostable relatively to anti-melitensis. The succeeding section gives details of the clinical conditions and the serological findings in support of this last contention. In section 5 the authors give a more detailed account of the methods of isolating the *B. abortus* from man, and of its identification and pathogenicity for guineapigs. The organism is obtained by inoculating 5–10 cc. of the patient's blood into liver-broth anaerobically, with 1 : 10,000 gentian violet. Growth occurs in 12–14 days and the organism can be subcultivated on agar. This process takes advantage of the property of the *B. abortus* of growing better, in the early stages at least, in partial anaerobiosis. Another method is by direct intraperitoneal inoculation of material into guineapigs. Death occurs between the twentieth and thirtieth days with purulent peritonitis and the organism is obtained again unmixed from the blood, spleen, liver and peritoneal exudate. Morphologically, on first culture Bang's organism is a definite bacillus and only resembles the cocco-bacillary form of *M. melitensis* on sub-culture. Section 6 gives the clinical differences between cases of abortus infection and undulant fever, the chief of which are that in the former there are daily remissions in the temperature, which ,however, remains high for some months, perhaps five or six, instead of the shorter periods of the latter with longer remissions of apyrexial periods; also, shivering is more frequent and sweating much more profuse in abortus infection, and complications are more severe, such as pyo-arthrosis, orchitis, otitis, pleurisy and peritonitis; finally, the mortality is greater.

The two last sections speak briefly of the use of vaccines in treatment of abortus infections in man, and of preventive measures.

The article is full of important points which will probably bring out the experiences of other workers in this field, and the agglutination tests, if found by others to be as specific as recorded here, will constitute a valuable means of differentiating the two organisms. The paper concludes with an extensive bibliography of nearly 70 references.

H. Harold Scott.

[The differentiation by heating of *abortus* from *melitensis* serum seems very simple, but many factors may come into play and the observations most certainly require confirmation from other laboratories. Heating serum to 65–69° for half an hour would render results of reading unreliable from coagulation of nucleoproteins; all other proteins coagulate at 70–85° according to acidity. (Hawk's Practical Physiological Chemistry. 8th Edit. pp. 249–250.) At 70° undiluted ordinary serum becomes solid.—P. W. B-S.]

Viviani (Rodolfo). **A proposito della questione della patogenicità del "Bacillus abortus" di Bang nell' uomo.**—*Policlinico.* Sez. Prat. 1925. Feb. 9. Vol. 32. No. 6. pp. 203–206. [19 refs.]

This is an inconclusive contribution to the study of the differentiation of *Micrococcus melitensis* infections from those by *Bacillus abortus.* Two cases are recorded, from each of which an organism was obtained by blood culture. The patient's serum in each case agglutinated in equally high dilution the two organisms, but the isolated bacillus was agglutinated a little better by melitensis serum (1 in 1,200 as against

1 in 1,000). The author concludes [as regards the former, at least; he makes no remark about the second] not very convincingly that "the diagnosis of Malta fever was undoubtedly the correct one."

H. Harold Scott.

BURNET (Et.) & CONSEIL (E.). **Présence du** *Micrococcus melitensis* **dans le lait d'une femme nouvellement accouchée ; résistance du nourrisson à l'infection par le lait maternel. Ce que suggere cette observation.**—*Arch. Inst. Pasteur de Tunis.* 1925. Jan. Vol. 14. No. 1. pp. 121–125. With 1 chart in text. [7 refs.]

The authors report a most interesting case of undulant fever in a newly delivered woman (4th day). It was proved by agglutination and intradermic tests, treated with abortus vaccine, and the fever terminated on the 20th day. The woman suckled the infant, and up to the 7th month, although the micrococcus was isolated from the milk in small numbers, the child showed no sign of infection and gave no evidence of the disease serological or intradermic. The most interesting points are (1) though the mother must have been infected some time previously she did not abort; (2) the case was cured by four injections of abortus vaccine; (3) the child remained unaffected though suckled. In goats the infection of the milk is often heavy (1,000 to 3,000 per cc.); the milk of the woman gave only 2 per 0·5 cc. What is the cause of the immunity of the new born? Was it transmitted through the blood of the mother? and does this immunity occur in calves from abortus-infected mothers? The evidence of WILLIAMS and HUDDLESTON is contradictory. It appears that even if the young develop antibodies in the blood they last only a short time as the animals may become chronic carriers though remaining in perfect health (QUINLAN).

The question whether the infant or calf can acquire the disease by the milk is most important. It must be remembered that it has been established experimentally by NICOLLE and CONSEIL for undulant fever, and by CALMETTE for tubercle, that immunity can be acquired by the digestive tract especially in young subjects. The observations recorded do not give any reply to the two questions, but they show how important it is to correlate the clinical and laboratory findings.

P. W. B-S.

ROZIÈS (H.). **Le fièvre de Malte chez l'enfant. (Un cas chez un enfant de 18 mois guéri en 20 jours par la vaccino thérapie.)**—*Progrès Méd.* 1925. Jan. 24. No. 4. pp. 129–133.

The author describes a case of melitensis infection in a child aged 18 months who made a rapid recovery when treated with iodized vaccine of RANGUE and SENEZ. The father contracted the disease first; it ran a severe course and resisted the vaccine; it was cured after 60 days under the influence of a fixation abscess. The child was separated from the father and is said to have been brought up on boiled goat's milk.

A discussion on the frequency of these infantile infections and their characters follows; the author emphasizes his belief in the value of vaccine therapy in the treatment of the disease and states that his experience controverts the statements of COUVY as to its dangers.

P. W. B-S.

D'ARBELA (Felice). **Una sindrome emorragica precoce della febbre mediterranea.**—*Riv. di Clin. Med.* 1925. Feb. 15 & 28. Vol. 26. Nos. 3 & 4. pp. 89–96; 131–141. [31 refs.]

A lengthy description of a case of undulant fever, clinically mild, but in which haemorrhages appeared early, on the sixth day of disease. There was a purpuric rash on the trunk and limbs, with haematuria and passage of blood by the bowel. These symptoms did not clear up till the end of the second week. Medicinal treatment consisted in the administration of four injections of stomosine on alternate days. The remainder of the paper is devoted to a narration and discussion of previously recorded cases in which haemorrhage was a prominent feature, but in them the bleeding occurred later in the course of the disease. In the author's case there was no indication of a haemophilic tendency.

H. Harold Scott.

DARGEIN & DORÉ. **Des formes frustes de la mélitococcie.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. Jan. 29. Year 41. 3rd Ser. Vol. 49. No. 3. pp. 122–125.

The cases noted by the authors vary much from the typical forms. They describe two in detail which but for laboratory methods would have been undiagnosed, both having been treated as malaria. Auto-vaccine and injection of convalescent serum did not appear to cause any improvement, and no specific treatment had been given. The disease was traced to the ingestion of fresh unsalted unfermented cheese called "fromage cervelle," made from the milk of sheep or goats, and much prized by the population of Toulon. Its preparation is described in detail. It is recommended that steps should be taken to prevent the sale and consumption of these dangerous cheeses, a more important precaution than disinfection after contraction of the disease.

P. W. B-S.

DOMINGO (P.) & LOPEZ (C.). **Etudes sur la fièvre de Malte. Bacille de Bang et *Micrococcus* de Bruce; méthode de différenciation.**—*C.R. Soc. Biol.* 1925. Mar. 20. Vol. 92. No. 10. p. 809.

The authors state that further experiments have confirmed their previous observations on the value of ox bile in reviving the specific characters of the *M. melitensis* for agglutination use, and reducing the non-specific action of old cultures. Not only is the melitensis organism rendered more reliable but by the same treatment the agglutinogenic properties of the *B. abortus* are also modified and therefore differentiation of the two organisms is assisted.

P. W. B-S.

BURNET (Et.). **Des réinoculations dans l'infection à *M. melitensis* en particulier d'après la maladie expérimentale du cobaye.**—*Arch. Inst. Pasteur de Tunis.* 1925. Jan. Vol. 14. No. 1. pp. 62–82. [10 refs.]

It was demonstrated that reinfection of guineapigs with *M. melitensis*, if subcutaneous, caused a fever reaction; if in sufficiently large dose into the peritoneum, the animal dies with the formation of an abundant exudate and congestion of the abdominal organs.

Reinoculation provokes a local reaction analogous to that of KOCH, characterized rather by abscess formation than by necrosis, but less intense than that of tubercle. It is possible to distinguish a reaction due to the toxin and one to the microbe, so that the two reactions are not altogether independent. With guineapigs the reaction to "melitine" is more pronounced than that caused by the microbe bodies. These reinfections do not increase the susceptibility to the *M. melitensis*, and therefore their use for vaccine therapy is not contra-indicated. It was found that the inoculated microbes disappear rapidly from the infected animal; they are not eliminated in the bile or urine, but are attacked and destroyed by the phagocytes. The reaction of hypersensibility and the application which has been made of it for diagnosis constitutes a striking analogy between undulant fever and tuberculosis. The guineapig was found to be the animal most useful for the study of the various reactions caused by the *M. melitensis*.

P. W. B-S.

OCARANZA (F.) & VARELA (G.). [**Malta Fever in Mexico.**]—*A.M.M. Mexico.* 1924. Dec. Vol. 2. p. 615. [Summarized in *Jl. Amer. Med. Assoc.* 1925. Feb. 28. Vol. 84. No. 9. p. 713.]

The author states that a number of sporadic cases of a somewhat irregular type of the fever have been observed in Mexico, but no evidence of any endemic centres has been made out. The diagnosis is most surely determined by the intra-dermal reaction, which is stated to be constantly positive by the 7th to the 10th day, and persists for months afterwards.

P. W. B-S.

APPIETO (M.). [**Diagnostic de la fièvre méditerranéenne par l'intradermo-réaction de Burnet.**—*Thèse Fac. Méd. Montpellier.* 1924. 81 pp. [Summarized in *Bull. Inst. Pasteur.* 1924. Nov. 30. Vol. 22. No. 22. p. 891.]

For the differential diagnosis of undulant fever the author found that the intra-dermal reaction was the most satisfactory method. It was positive in 28 cases of undulant fever, and negative in 100 controls of various conditions other than this disease.

P. W. B-S.

FICAI (Giuseppe) & ALESSANDRINI (Alessandro). **Setticemia da "Micrococcu melitensis" e da "Bacillus abortus (Bang)" nell'uomo. Nota preventiva.**—*Riforma Med.* 1925. Jan. 19. Vol. 41. No. 3. pp. 57–58.

DENGUE, PAPPATACI AND UNCLASSED FEVERS.

HARRIS (William H.) & DUVAL (Charles W.). **Studies upon the Etiology of Dengue Fever. 1. Experimental Transmission to the Lower Animal.**—*Jl. Experim. Med.* 1924. Dec. 1. Vol. 40. No. 6. pp. 817–833. With 2 text figs. [5 refs.]

In the American epidemic described, the symptoms were generally typical—moderately severe pyrexia with primary and secondary waves, maculo-papular eruption and leucopenia. The animal experiments were made from 16 human cases; 143 guineapigs and monkeys were used for the initial transmissions and 43, representing 11 human cases, reacted in the characteristic manner. No spirochaetes were found by any means of observation.

In the experimental animals marked changes were found, consisting of endothelial proliferation in the lymphoid tissues and enlargement of the spleen and lymph glands. The constant and uniform results in all the positive cases indicate that the virus of dengue is not only transmissible to guineapigs but can also be propagated in these animals through an undetermined number of successive generations. Two strains have been continued for 36 and 45 generations.

P. W. Bassett-Smith.

DUVAL (Charles W.) & HARRIS (William H.). **Studies upon the Etiology of Dengue Fever. II. Cultivation and Nature of the Virus.**—*Jl. Experim. Med.* 1924. Dec. 1. Vol. 40. No. 6. pp. 835–844. With 3 plates and 1 text fig. [5 refs.]

The observations were made from cases in the same epidemic (see above). The authors found that minute organisms could be grown on the special media devised by NOGUCHI. They were globoid bodies ·1 to ·3μ in diameter, arranged singly, in pairs or in short chains; these readily pass through a Berkefeld filter (N & V) and the filtrate gives rise to a reaction in guineapigs, similar to that observed after the injection of the whole blood of a dengue case. Animals could be successfully inoculated with cultures several generations old. Initial cultures have been obtained direct from the whole blood of human cases as well as from infected guineapigs, but the earlier generations only retain sufficient virulence to cause the experimental reaction. No spirochaetal bodies were ever seen.

They conclude that the anaerobic globular bodies they have described may have an etiological relation to dengue, but recognize that further proof and confirmation of their work is required.

P. W. B-S.

D'EMPAIRE (Adolfo). **Sobre una fiebre de corta duración que se observa en Maracaibo.**—*Rev. Med. y Cirug.* Caracas. 1924. Aug. 31. Year 7. Month 10. No. 77. pp. 197–200.

Many new-comers to Maracaibo are attacked, some after a few days only, others after several weeks, by a sudden onset of acute fever up to 40° C. (104° F.) with intense headache, pain in the back and limbs, sometimes vomiting and albuminuria. A generalized rash appears on the second or third day and there is a slow pulse, perhaps 40 per minute. The symptoms clear up in 3 or 4 days, the slow pulse

remaining for a few days longer. The idea was formerly prevalent that the disease was a mild form of yellow fever. Later it was regarded as dengue, but the general opinion now is that it is phlebotomus fever.

H. Harold Scott.

RUIZ (Villegas). **Un caso de fiebre de tres días o fiebre a papatacis.**—*Gac. Med. de Caracas.* 1924. Sept. 15. Vol. 31. No. 17. pp. 266–268.

Cases of fever of brief duration occurring at Macuto have by some medical men been regarded as pappataci fever, but others have denied this. The patient whose case is here recorded had come from Macuto, and two days later was suddenly attacked by shivering, intense headache and pains in the limbs, with a temperature of 39 ·5° C.and great prostration. The following day the pulse was slow, 60 per minute, and a scarlatiniform rash developed on limbs and trunk, but there was no sore throat. All the symptoms, except the bradycardia, cleared up in three days, and by the end of a week the patient felt quite well. The author regards this as an undoubted case of pappataci fever.

H. Harold Scott.

TRABAUD (J. P. R.). **La fièvre estivale de trois jours.**—*Arch. Méd. et Pharm. Milit.* 1925. Jan. Vol. 82. No. 1. pp. 25–49. With 1 fig. & 5 charts in text. [30 refs.]

The author gives a very full review of the short fever of the Eastern Mediterranean known as three day fever, a term he prefers to phlebotomus fever. Exception may be taken to the statement that it is essentially Mediterranean. In discussing the habits of the phlebotomus no mention is made of WHITTINGHAM's work. He discusses rather fully its relation to dengue and tabulates the differences; most of the doubtful cases, he thinks, are abnormal dengue, the three day fever being typical, without eruption, often relapsing, having no direct complications but predisposing to other infections.

P. W. B-S.

PONTOIZEAU (E. M. M.) & DUTREY (M.). **Contribution à l'étude de la fièvre des trois jours (fièvre pappataci). Son traitement par l'autohématothérapie (avec adjonction de faibles doses de novarsénobenzol.)**—*Arch. Méd. et Pharm. Milit.* 1925. Jan. Vol. 82. No. 1. pp. 50–59. With 5 charts. [11 refs.]

From their experience in Syria the authors divide the short fevers so common there into three day or pappataci fever, the most frequent and most benign, and dengue, which is much rarer. A description of the two diseases contains nothing new. They introduced autohaemotherapy as a method of treatment for three day fever and found it gave satisfactory results in a number of cases. As soon as possible after the onset of the disease about 20 cc. of blood is taken and 5 cc. of this is injected intramuscularly, a small quantity of novarsenobenzol in the syringe preventing coagulation. A second inoculation of about 10 cc. is given on the following day, and on the 4th and 7th days further injections, after a small intravenous injection of novarsenobenzol. The four injections cure by "shock." The treatment shortens the fever, reduces the pains, and the convalescent period shows none of the asthenia, anorexia, or depression which is so frequent and troublesome; recurrences also appear to be less common.

P. W. B-S.

WHITTINGHAM (Harold E.). **The Aetiology of Phlebotomus Fever.**—*Jl. Roy. Army Med. Corps.* 1925. Mar. Vol. 44. No. 3. pp. 196–203. [13 refs.]

In this restatement of his observations the author insists upon the importance of recognizing that *P. papatacii* is the most common vector, and of understanding the life history, development, and breeding of the insect.

P. W. B-S.

MEGAW (J. W. D.), SHETTLE (F. B.) & ROY (D. N.). **Typhus-like Fever, probably Tick-Typhus, in Central India.**—*Indian Med. Gaz.* 1925. Feb. Vol. 60. No. 2. pp. 53–58. With 6 plates (2 coloured) & 3 charts.

Sixteen cases of a peculiar typhus-like fever, which occurred in the Saugor district, C.P., and affected 14 Europeans and 2 natives, were brought by letter to the notice of Megaw by Shettle, who was in charge of them. All had been exposed to tick bites, but no tick was ever found upon them. The fever was of an irregular remittent type, lasting about 14 days, with a petechial rash appearing from the third to the fifth day. There were no deaths, and no evidence of man to man infection. The Weil-Felix reaction was generally negative, as were all other serum tests. The cases differed from those described as tick-typhus of the Kumaon hills in that no evidence of tick infection was found; there was more conjunctivitis and greater remissions of the temperature. Animal experiments carried out in Calcutta failed to demonstrate a virus, but were an insufficient basis for conclusions. The cumbersome name of "jungle typhus-like fever" is provisionally given to this fever. Two indifferently coloured plates, four photographs and several charts are inserted.

P. W. B-S.

MEGAW (J. W. D.). **Indian Tick-Typhus.**—*Indian Med. Gaz.* 1925. Feb. Vol. 60. No. 2. pp. 58–61.

The term "tick-typhus" appears to be the most appropriate name for what seems to be a definite disease in India, conveyed by means of ticks. The author in 1924 drew up a table of the typhus-like fevers conveyed by various vectors in different parts of the world, having in many ways a close resemblance to Rocky Mountain fever and to louse-borne typhus. It must be noted, however, that the evidence that the tick is the true carrier in India is only epidemiological; no scientific proof has yet been brought forward. It is nevertheless probable that lice, ticks, and mites do convey a typhus-like fever in different parts of the world, and the classification—louse typhus, tick typhus, and mite typhus—of the author is apposite. The characters of seven cases are set out in tabular form.

P. W. B-S.

BALFOUR (Andrew). **So-called Pseudo-Typhus.**—*Kenya Med. Jl.* 1925. Mar. Vol. 1. No. 12. pp. 352–358. [21 refs.]

This is an interesting short review of our knowledge of pseudo-typhus. Special reference is made to the work of MEGAW, but that author does

not mention "fièvre boutonneuse" of CONOR & BRUCH (1910), which is here described; fevers of this description were found in Tunis, also by GABBI in Tripoli, and Balfour in Khartoum. Cases of typhus-like fevers have been described by MCNAUGHT from South Africa and by GILKS in Kenya. They appear to be spread by some insect vector not at present known, though lice seem to be ruled out; mites have been suggested. The likeness of these fevers to Brill's disease and Rocky Mountain fever has been referred to; MCNAUGHT thought the African type was Brill's disease; in many ways the Kenya fever is more allied to this than to "fièvre boutonneuse" of N. Africa. The typhus-like fever of Deli has by recent Dutch observers been proved to be carried by two forms of mites, *Trombicula deliense* and *T. schuffneri*; the virus, though not yet discovered, is possibly a spirochaete; this work should be followed up in Kenya.

P. W. B-S.

PRATES (Manuel Maximo). **Febre de carraças não recorrente endémica em Lourenço Marques.** [Non-Relapsing Tick Fever endemic in L.M.]—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a, 7a e 8a Sessões.) 1923. Aug. No. 4. pp. 327–341.

The endemic remittent fever of Lorenço Marques, associated with ticks of the genus Rhipicephalus, and possibly Amblyomma, is different from ordinary tick-conveyed relapsing fever. Two cases are described in detail, one benign, the other more acute. In both the patient had been previously bitten by ticks.

The former felt feverish and complained of pain in the inguinal region, with difficulty in walking, and the glands of the groin were tender. Just below the iliac spine there were some small scabs with a red areola. Examination of the centrifuged blood revealed "flagellates the size of *Spirochaeta duttoni* with poorly marked undulations." 30 cgm. of novarsenobenzol was given intravenously. The temperature rose to 38° C., and a discrete papular eruption appeared on the face, due, it was supposed, to the injection. The temperature fell and the infecting papule cicatrized leaving a pigmented macule. In the other case the symptoms were more severe. There were attacks of shivering, and the temperature rose in three days to 40° C. There were no malarial parasites found, and Widal's agglutination proved negative, but the white cell count showed a lymphocytosis of 47–53 per cent. There was, on the breast, a small, dark scab with a red border, like a small vaccinia pustule in the scab-stage; the neighbouring glands were enlarged and painful, and there were inflamed lymphatics traceable from the sore to the glands. A similar sore was seen on the right hip with corresponding lymphadenitis. The temperature did not reach normal for 9 days, and the glands continued painful for some time longer.

Treatment consisted in disinfection and cauterization of the primary pustule, in belladonna locally for the adenitis, and in the internal use of saline aperients, aspirin for the headache and backache, and, if spirochaetal infection was suspected, 914 intravenously. No fatal case has been recorded. The question of diagnosis is considered and the author concludes that the disease in many respects resembles Japanese river fever.

H. Harold Scott.

OHTAWARA (Toyoichi). **Recherches sur une fièvre endémique accompagnée de lymphadénite généralisée. Premier Rapport.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 819–832. With 2 charts in text. [5 refs.]

In the prefecture of Kumamoto a febrile disease with lymphatic enlargement, named Kagaminetsue, has been known in an epidemic form for many years; it started in the village of Kagami, hence its name. The author has for some years studied it but has not been able to find the pathogenic agent or any certain method of prophylaxis or treatment. He describes it as a specific acute endemic disease with generalized adenitis and remittent fever of two or three weeks' duration, having no complications and no mortality. Manual work in the fields is a predisposing factor and men suffer most. The onset may be sudden or gradual; the fever is accompanied by headache, malaise and often congestion of the mouth and throat. There is constipation, enlargement of the liver, spleen, and most of the lymphatic glands, an eruption of a dengue type and a slight leucocytosis.

It has to be diagnosed from malaria, enterica, dengue and spirochaetosis. It is transmissible to monkeys (Pithecus and Macacus) and guineapigs. Immunity is conferred by an attack. For treatment salvarsan was found effective, and though no etiological agent was demonstrated it is probably of a protozoal nature. Two cases are fully described and temperature charts are given.

P. W. B-S.

HONE (F. S.). **Further Cases resembling Endemic Typhus Fever (Brill's Disease).**—*Med. & Scient. Arch. of the Adelaide Hospital. No. 3. (Supplement to the Ann. Rep. Adelaide Hospital for the Year 1923.)* pp. 20–31. With 7 charts.

The author describes eight fresh cases of this disease treated in hospital and eight others reported from outside. The diagnosis on admission varied from measles to typhoid fever, but the course of the cases was similar to those previously described. Both males and females were affected and the cases were fairly distributed throughout the year. The incubation was about 10 days, the rash appeared about the 7th and defervescence on the 14th day.

With regard to the etiology the relation to food was again noticed in a few cases. The majority of the shop assistants who contracted the disease were from food or grocery stores, though in others no definite association with food could be found.

Dr. BULL reports a positive Weil-Felix raction in all the 16 cases, from 1/40 upwards—whereas in 61 control cases it was negative. Heating the serum to 56° C. for half an hour did not completely destroy the agglutinating power, but heating to 65° did.

P. W. B-S.

DE MELLO (Froilano), BRAS DE SÁ & COLOPO (Gonopote). **A evolução das concepções patogénicas da febre na India Inglesa e Portuguesa.**—*Bol. Ger. Med. e Farmacia.* Bastora. 1924. July. 9th Ser. No. 7. pp. 309–319.

ROCKY MOUNTAIN FEVER.

i. SPENCER (R. R.) & PARKER (R. R.). **Rocky Mountain Spotted Fever: Experimental Studies on Tick Virus.**—*Public Health Rep.* 1924. Nov. 28. Vol. 39. No. 48. pp. 3027–3040. With 6 charts. [3 refs.]

ii. —— & ——. **Rocky Mountain Spotted Fever: Non-Filterability of Tick and Blood Virus.**—*Ibid.* Dec. 26. No. 52. pp. 3251–3255. [2 refs.]

i. "1. In confirmation of earlier observations of previous workers, ticks of the species *D. andersoni* which have received the infection of Rocky Mountain spotted fever in the larval or nymphal stage retain it in the adult stage.

"2. A 24-hour incubation at 37° C. of unfed hibernating nymphs and adults infected as larvae and subsequent injection of emulsions of such ticks into guineapigs give a higher percentgge of positive infection than the injection of similar ticks not incubated.

"3. Infection of Rocky Mountain spotted fever in adult ticks subjected to winter temperatures (32° F. or below) may be demonstrated by the production of immunity in guineapigs following the injection of tick viscera immediately upon removal from cold temperatures, by a moderate but typical spotted fever following the injection of ticks after 24 hours incubation at 37° C., and by virulent spotted fever following tick feeding or the injection of ticks after feeding.

"4. Control adult ticks free from all infection do not produce death or illness in guineapigs by feeding nor by injection of such ticks after feeding.

"5. One infected adult tick may contain, after feeding, from 3,000 to 5,000 M.I.D. [minimum infectious doses] for a guineapig.

"6. Emulsion of infected fed adult ticks treated with 0·5 per cent. phenol will protect guineapigs against 1 cc. of blood virus.

"7. Nothing in the behaviour of blood or tissue virus is comparable to the changes observed in tick virus."

The killed virus of one fed tick is sufficient, injected, to protect a guineapig, but the period of immunity so produced is not yet known.

ii. Further experiments showed that the virus of Rocky Mountain fever as it occurs in the blood of guineapigs and in the emulsion made from infected ticks will not pass through a Berkefeld N. and V. filter, that the inoculation of the filtrates of blood or tick virus does not produce immunity in guineapigs, that the coarse V. filters which hold back the virus will readily pass cultures of *Staph. aureus*, and that this failure of the virus to pass through the filter does not depend upon any chemical affinity for, or adsorption property of, the filter substance.

P. W. Bassett-Smith.

CONNOR (Charles L.). **The Identification of the Organism of Rocky Mountain Spotted Fever in the Blood.**—*Jl. Infect. Dis.* 1924. Dec. Vol. 35. No. 6. pp. 587–590. With 2 text figs. [3 refs.]

The author was able to isolate the *Dermacentroxenus rickettsii*, or organism which he believed to be this, from the serum of infected animals, few in number but not differing from the forms described by WOLBACH and NICHOLSON in tick and animal tissues. Three methods were used—(1) Dilution of the serum with 5 vols. of normal salt solution and centrifuging at high speed for at least 6 hours; (2) Diluting the serum with distilled water, 1 in 5, and prolonged centrifugation; (3) Intraperitoneal inoculation of normal guineapigs, which were killed

in about 48 hours, and smears made from the peritoneal exudate. He writes :—"The fact that it has been found in the blood and serum does not completely dispense with speculation as to the real form of the organism in this situation. The small numbers found may be present from broken-down cells and be quite accidental and transient. *The unusual virulence of the blood* (0·001 *cc. often being infectious*) *seems somewhat incompatible with the exceedingly small number of organisms found.*" [Reviewer's italics.]

P. W. B-S.

TAKEUCHI (Nobuyuki). **The Comparative Pathological Studies on the Rocky Mountain Spotted Fever. I. Morphological Researches on the Origin of the Disease.**—*Aichi Jl. Experim. Med.* 1924. Dec. 20. Vol. 1. No. 4. pp. 175–195. With 2 plates. [37 refs.]

The author, working with Prof. HAYASHI on material supplied by PARKER in America, reports the result of his investigations which confirm the work of HAYASHI. Monkeys, guineapigs, rabbits and rats were used ; the former were the most susceptible, the symptoms and pathological findings agreeing most closely with those seen in man. Four different morphological conditions of the organism are described : (1) The spirochaetal, rare ; (2) filamentous ; (3) bacillary forms ; (4) coccoid. These were all found in *smears* and sections of organs, so that they are looked upon as being different stages in the life cycle of the same organism, but whether spirochaetal or Rickettsial is not yet determined. A good deal of the work is in accord with that of RICKETTS, WOLBACH, PARKER and others, but special attention is drawn to the presence of the different forms of the organism described in the parenchymatous cells of the liver and kidney, as well as in the endothelial cells of the blood vessels ; the organisms are found also in the testis, spleen, lymph nodes and skin. They may be intra- or extra-cellular, or on the erythrocytes ; examples of the different forms are shown in the micro-photographs.

[It should be noted that WOLBACH in a private letter discounts the value of these findings since the technique used and the specimens seen were not satisfactory or conclusive (see this *Bulletin*, Vol. 21, p. 927).]

P. W. B-S.

SLEEPING SICKNESS.

SCHWETZ. **Rapport sur les travaux de la Mission médicale anti-trypanosomique du Kwango-Kasai 1920-1923.**—*Ann. Soc. Belge de Méd. Trop.* 1924. July. Vol. 4. No. 1. 137 pp. With 21 figs & 5 maps.

This number is an account of the work of the anti-sleeping sickness mission of Kwango-Kasaï during the first three years (1920–1923) of its activities. The mission was organized as the result of a preliminary survey of Kwilu in 1918.

The report commences with a brief summary of the state of affairs found in Kwilu in 1918: in four months' examination it was found that about 7·5 per cent. of the total inhabitants were infected, and this serious state of things rendered it necessary to undertake an active campaign with a view to check the epidemic.

After a chapter dealing with the value of gland palpation as a means of diagnosis, an account is given of the state of sleeping sickness and what is being done to combat it in the eight divisions into which the territory has for sleeping sickness prophylactic purposes been divided, viz., Kikwit, Bulungu, Kandale, Niadi, Kamtsha-Lubue (Kasaï), Bas-Kwilu (Kwango), Bapende (Kasaï) and Lukula (Kwango). The first of the districts where the work started in 1920–21 has been re-examined twice since, viz., in 1922 and 1923; Bulungu and Kandale have each been re-examined once, Niadi is in the process of being re-examined, and the remaining four districts have not yet been re-examined. In the following table the results of the successive examinations of Kikwit, Bulungu and Kandale are given. [It should be noted that the diagnoses were based on gland palpation and not on microscopic examination.]

Comparative Table of Successive Examinations of the Territories of Kikwit, Bulungu and Kandale.

Villages.	Examinations.	Examinees.	Infected.	Per cent.	Treated.
Kikwit ...	1st	79,525	9,991	12·8	9,991
Kikwit ...	2nd	87,587	8,731	9·9	14,066
Kikwit ...	3rd	100,317	6,041	6	15,193
Bulungu ...	1st	80,250	9,763	12·2	9,763
Bulungu ...	2nd	80,792	2,760	3·3	8,864
Kandale ...	1st	32,942	2,067	5·5	2,067
Kandale ...	2nd	40,143	372	1	1,782

The main points in this report have already been published elsewhere and have been summarized [this *Bulletin*, Vol. 15, p. 381; Vol. 19, p. 501; and Vol. 21, p. 371].

The report is illustrated by a number of excellent maps and by numerous tables setting forth the results of examination of the population in the various places in the eight districts.

W. Yorke.

i. LETONTURIER, DE MARQUEISSAC & JAMOT. **La prophylaxie de la maladie du sommeil au Cameroun dans les secteurs du Haut Nyong et de Doumé.**—*Ann. Inst. Pasteur.* 1924. Dec. Vol. 38. No. 12. pp. 1053–1100. With 7 figs. & 1 map. [2 refs.]

ii. ——, TANON & JAMOT. **La maladie du sommeil au Cameroun et sa prophylaxie.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a, 7a e 8a Sessões.) 1923. Aug. No. 4. pp. 143–147.

iii. LASNET. **La prophylaxie de la maladie du sommeil dans le Cameroun.**—*Bull. Office Internat. d' Hyg. Publique.* 1925. Mar. Vol. 17. No. 3. pp. 251–260.

i. The paper opens with a brief summary of the development of sleeping sickness work in the Cameroons from the discovery of the disease in Haut Nyong by STEIN in 1901, to March 1922, when Jamot took over from JOJOT the charge of the anti-sleeping sickness organization.

It is the object of the organization which has existed since this period to revisit the portions of the three sub-divisions which constitute the sector and to examine methodically one by one as great a number as possible of the inhabitants, thus making a census of the cases of trypanosomiasis, and finally to treat the infected at regular intervals. Diagnosis and treatment are based on microscopic examination under the direction of a doctor, and the patients are provided with a tally; the ultimate care of the patients is under the direction of Europeans, who visit the village periodically.

A number of pages are devoted to the diagnosis of sleeping sickness on a large scale. As previously mentioned, the authors base their diagnosis on microscopic observation. The triple centrifugation method of blood examination, which gives 92 per cent. of positive results, is evidently the most certain means of discovering the trypanosome, but is suitable only for the laboratory or hospital. The examination of fresh gland juice is, on the contrary, very easy and is the most practical procedure in the field. It is, however, not infallible and allows the escape of all patients whose glands are not puncturable and all those who have not lymphatic reactions and those who, even though the glands are puncturable, are negative. In order to obviate this difficulty the authors have supplemented the examination of gland juice by the examination of thick blood films. In 17,485 patients in whom trypanosomes have been sought on one occasion by these two methods of examination, the gland juice has been positive 13,807 times (79 per cent.) and the blood 11,712 times (66 per cent.); in 8,036 cases (45 per cent.) parasites have been found both in the gland juice and blood, and in 3,676 cases (21 per cent.) only in the blood. The authors conclude this section with a warning concerning the basing of diagnosis of sleeping sickness on gland palpation alone.

The next section deals with treatment. Commencing with atoxyl, the authors discuss briefly the various methods of administering this treatment, which has been adopted by the French during the last twenty years. JOJOT had endeavoured to inject 0·5 gm. of the drug every six days until the total of 7·5 gm. had been given. The treatment was then suspended and the patient examined after a month. In point of fact, most of the patients had been treated very irregularly,

and this could hardly be otherwise. In 1921 JOJOT (this *Bulletin*, Vol. 19, p. 501) showed that atoxylization by the above method caused disappearance of the trypanosomes in 95 per cent. of the cases. The authors examined 2,033 of JOJOT's cases, which received during two years one to forty-eight injections of small doses of atoxyl, and found parasites in the blood of 739 (32 per cent.). The systematic atoxylization which, according to the authors, gives the best result from a prophylactic point of view, is an administration of massive doses repeated every fifteen days, every month, or even every two months.

After a short discussion on the question of associating other drugs with atoxyl, the authors pass on to "Bayer 205" and tryparsamide. "Bayer 205" was given to 35 patients in whom the disease was of eleven to twelve months' duration. Two or three injections, each of 1 gm., were given at 3 to 7 days' intervals. Of thirteen patients in whom the cerebro-spinal fluid was normal, nine were apparently cured, and four relapsed and were treated with atoxyl. All are in perfect health. Of twenty-two patients in whom the cerebrospinal fluid showed changes eleven are dead. Of the remainder six have relapsed. In none of the patients was there any improvement of the meningeal reactions. With regard to tryparsamide the authors state that they have received 250 gm. for trial, and that their results confirm entirely those of Miss PEARCE.

Other sections deal with the distribution of the disease in the Cameroons, with the question whether it is progressing or retrogressing, with the morbidity of the disease in each sex and at different ages, and with its evolution and prognosis.

The following are amongst the conclusions :—

It is clear that sleeping sickness has obtained a firm footing in the Cameroons for many years in the regions of the Haut-Nyong and of Doumé.

On account of the relative density of the population in these countries, the disease has shown itself exceptionally contagious, especially amongst the river tribes of Nyong.

It has shown little tendency to retrogression, but in the south-west corner of the Doumé district it is apparently disappearing from a certain number of places where it has been endemic for ten years.

Elsewhere the disease is spreading more or less actively in all directions. Although less virulent than in certain other regions of Equatorial Africa, it is an important factor in the death rate.

The fundamental task of prophylactic service is to explore methodically village by village, and inhabitant by inhabitant, of the contaminated regions, or those merely suspected of being contaminated, and to determine with care the limits of the disease and thus the natural frontiers of the prophylactic sectors.

One is thus able to supervise the movements of the natives from infected to uninfected areas by visiting as often as possible the zone bounding the contaminated and uncontaminated regions.

Examination of the cerebrospinal fluid in nearly five hundred cases indicates that about half the patients are in the first stage of the disease and, consequently, can be cured, and therapy should therefore be directed not merely towards rendering the patients non-infective, but to curing all that are curable.

ii. This is practically a summary of the preceding paper.

iii. This paper gives a summary of the organization and functioning of the Service directed against Sleeping Sickness in the Cameroons. This region comprises the administrative subdivisions of Akonolinga,

Abong-Mbang and Doumé, in which the population is 129,000. It deals with very much the same matter as the paper of LETONTURIER, de MARQUEISSAC and JAMOT.

W. Y.

VASSAL (J.). **La maladie du sommeil en Afrique Equatoriale Française. Résultats de tournées dans les Colonies du Moyen-Congo, de l'Oubangui-Chari, du Tchad et du Gabon.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 727–754.

In this paper the author summarizes the results of his observations on sleeping sickness in the districts of the Middle-Congo, of Oubangui-Chari, of Tchad and of Gabon.

He visited the Middle-Congo district on three occasions, viz., during December, 1922, to February, 1923, during November, 1923, and during June, 1921. The observations made during the first period have already been published [this *Bulletin*, Vol. 21, p. 746].

In 1923, 4,822 persons were examined and 92 (1·9 per cent.) found to be infected, and in 1924, 1,463 persons were examined and 19 (1·2 per cent.) new cases found. The 1923 cases were re-examined during the 1924 tour and only two were found to be dead. The author states that without doubt a period of 18 months is not long enough to permit of deciding the results of treatment, but he adds "What would have become of these patients without treatment?" [This is a question concerning which it would be important to know the answer.]

The author made an extensive tour of almost 4,000 km. in Oubangui-Chari and Tchad with the object of inspecting the foci of sleeping sickness, the centres of greatest population, and the routes most frequented. Information is given regarding the amount of infection in the various villages and districts. Owing to the development of motor roads and the progress of its administration, Oubangui-Chari has been completely transformed and sleeping sickness work greatly simplified. Certain recommendations are made regarding future work. The Tchad sector is only partially contaminated in the south. It possesses an organization and the necessary means to prevent its invasion, and it is naturally protected on the north by the desert and by a climate which is unsuitable for tsetse.

Gabon was visited in June and July, 1924. The villages of the Bateke plateau were found to be free from infection, but 7 cases were found out of 258 persons examined in the villages between the Bateke plateau and Franceville. The last village enjoyed an evil reputation, and the proportion of cases of sleeping sickness has been variously estimated at between 10 and 40 per cent. of the population. The author found 5 per cent. infected among 237 persons in the Catholic Mission and 3 per cent. among 118 natives at the station; but possibly the true figures are higher. At Lastourville, which is a much more important centre than Franceville, the author examined 751 persons and found 16 new cases and 54 old ones, giving a total of 70 (9·1 per cent.).

It is difficult to form a definite opinion regarding the position of sleeping sickness in Gabon, and the disease is very unequally distributed. The infantile mortality is great, and never more than two children per adult female were found. This relative sterility is a general phenomenon in French Equatorial Africa. Certain recommendations for dealing with the situation are made.

W. Y.

BLANCHARD (M.). & LEFROU (G.). **Résultats des plus récentes recherches faites à l'Institut Pasteur de Brazzaville sur le diagnostic, le prognostic, le traitement, et la prophylaxie de la maladie du sommeil.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a, 7a e 8a Sessões.) 1923. Aug. No. 4. pp. 65–83.

In this paper, which is of a general nature, the authors deal with the question of diagnosis, prognosis, treatment and prophylaxis of sleeping sickness in the Belgian Congo. The paper does not lend itself to summarizing, and should be consulted in the original by those interested.

W. Y.

STEUDEL (F.). **Die "neue" Methode französischer Schlafkrankheitsbekämpfung.** [The "New" French Method of Sleeping Sickness Warfare.]—*Deut. Med. Woch.* 1925. Feb. 20. Vol. 51. No. 8. pp. 322–323.

This article is a criticism of the new French scheme for combating sleeping sickness, as outlined in "La Dépêche Coloniale et Maritime" of Oct. 10, 1924, the main point of which is, instead of merely seeking out the infected and rendering as many as possible temporarily non-infective, to make arrangements to render definite regions completely free from the disease and actually to cure the infected. The author states that the French have entered very late into the field campaign against sleeping sickness; formerly they contented themselves with laboratory studies at Brazzaville, and it is only about three years since they formulated definite plans for combating the disease in their equatorial Colonies. The sleeping sickness region was divided into 21 sectors, each of which was to be visited at least twice yearly by a doctor, assisted by 10 native hospital attendants, who would examine the population and inject the sick with atoxyl so as to render them non-infective to Glossina. Shortly after the introduction of this scheme papers appeared in the French press recording enormous numbers of examinations and injections.

The author asks why the French have suddenly dropped this highly praised method of atoxyl sterilization and changed to the method of treating the sick until they are cured. This "new" method was, in addition to clearing and other measures directed against Glossina, adopted by the Germans from the beginning and is also practised in English Colonies. It is suggested that the choice of the atoxyl sterilization method depended on the great disproportion between the small number of doctors available and the vast mass of sleeping sickness in the French Colonies. Further, such a scheme entails heavy loss amongst the medical staff, and the author pointed out that five French doctors died of the disease in about a year, and that in 1923 only 11 of the 21 sectors were supplied with a doctor and some of the 11 only for a part of the year. Steudel believes that this heavy loss of doctors is the essential reason of the change in policy. He points out, however, that for the "new" method far more doctors are necessary.

W. Y.

CORREIA (Alberto Carlos Germano da Silva). **A doença do sono em Angola.**—*Revista Méd. de Angola.* [No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a, 7a e 8a Sessões.) 1923. Aug. No. 4. pp. 157–175. With 6 charts. [6 refs.]

After a statistical enumeration of the number of cases of sleeping sickness which have occurred in various districts, notably Loanda, Dondo, Cabinda, Mossâmedes, and Benguela, month by month since 1873, there follows a brief résumé of the measures, from the administrative aspect, which have been put into force during the present century, and then suggestions for prophylaxis. The author states that he has nothing new to bring forward, but we notice that he mentions as one measure the destruction of the flies *en masse* by gas bombs dropped from aeroplanes.

H. Harold Scott.

DUKE (H. Lyndhurst). **Polymorphic Trypanosomes of the *T. brucei* Group recovered from the Mwanza Sleeping Sickness Area.**—*Ann. Trop. Med. & Parasit.* 1924. Dec. 30. Vol. 18. No. 4. pp. 415–435. [6 refs.]

The trypanosomes dealt with in this paper were obtained from the Mwanza Sleeping Sickness Area. The first two strains (human strain 483 and human strain "S") were obtained from human beings, and the third strain (wild fly strain "E") by feeding wild *G. swynnertoni* on a healthy monkey. Details of the passage of these three strains through a series of monkeys are shown in genealogical tables, from which the author concludes that it is clear that the three strains when first isolated were essentially identical in their behaviour in laboratory animals. No morphological differences were observed. All the strains were examined at intervals for posterior nuclear forms, which were found in each instance, though latterly not at every examination. An account is then given of transmission experiments carried out with laboratory bred *G. palpalis.* These experiments complete a series of three parallel studies on the effect of continued transmission of polymorphic trypanosomes of the *brucei* group. The strains examined are (1) the direct transmission strain isolated from wild Lake-shore *G. palpalis* in January, 1920; (2) the antelope strain isolated from a sitatunga antelope on Damba Island in September, 1920; and (3) the Mwanza human strain 483. All these strains when first isolated were readily infective for *G. palpalis.*

(1) *Direct Transmission Strain.*

After 11 direct passages, covering 16 months, this was still cyclically transmissible for tsetse, but after 23 more passages for a further period of 14 months the trypanosome was no longer able to develop in the tsetse. The exact period at which this change occurred was not determined, but the author believes that it coincided with the sudden increase in virulence which occurred about the 18th passage.

(2) *Antelope Strain.*

After 24 direct passages for a period of about 22 months this trypanosome had lost the power of invading the salivary glands of the fly. Heavy gut infections were, however, still obtainable. Ten months later, after 20 more passages, all power of development in the tsetse disappeared. The increase in virulence in the strain appeared about the 18th passage.

(3) *Mwanza Strain.*

After eight direct passages this strain had all but completely lost the power of development in tsetse. There had been no increase in virulence up to this point.

The author suggests that the fact that the Mwanza strain lost the power of cyclical development in tsetse much more rapidly than did the two Uganda strains can be explained on the assumption that whereas the Uganda strains were undoubtedly cyclically transmitted previously to their isolation in monkeys, there are reasons for believing that human strain 483 may have been subjected to a number of direct passages from man to man in the fly belt before reaching the native from whom it was isolated.

The last few pages of this important paper are concerned with a discussion of the above observations.

W. Y.

DUKE (H. Lyndhurst). **Trypanosomiasis Investigations.**—*Uganda Protectorate Ann. Rep. on the Bacteriological Dept. for the Year ended 31st December, 1924.* Part III. pp. 8–10.

In February, 1924, 3,455 wild *G. palpalis* caught in Damba Island were fed on healthy monkeys without any infection resulting; 1,163 wild flies were dissected and the proboscides examined to obtain the "game index," which proved to be 4·3. The blood of situtunga was inoculated into monkeys and the polymorphic trypanosome was recovered on one occasion. In September, 4,390 wild flies were fed on monkeys and one infection with the polymorphic trypanosome was obtained, the "game index" obtained from dissecting 1,511 flies proved to be 1·3 per cent. and the blood of three situtunga was inoculated into monkeys with negative results. As possibly the failure to recover trypanosomes from the many wild Damba flies was due to the inability of the organism to infect monkeys, four dogs were taken to Damba and each subjected to the bites of 1,500 flies, but no infection resulted.

Some 7,320 wild flies caught on the mainland near Entebbe were fed on clean monkeys, but no infection resulted. It is the author's intention to discuss these experiments with wild lake-shore flies more fully in a subsequent publication.

Reference is made to the inability of the Mwanza human strain to develop in Glossina after a number of direct passages through monkeys (*vide* previous summary).

The second part of the report deals with the reclamation of the shores and islands of Lake Victoria. The number of fishermen licensed during 1924 is 3,188, or 1,623 less than in the previous year. The population of the reclaimed area in the Buvuma Islands is 4,210, and in the Sesse Islands 6,531. Hitherto there has been no cause for apprehension about the success of the efforts made during the last five years to reclaim the fertile territory along the lake-shore. The indigenous polymorphic trypanosome still exists in the fly on Damba Island and no doubt elsewhere; but it seems probable that the reappearance of man has to some extent eliminated antelope from the fly's dietary in the re-populated area, and it may well be that the trypanosome, in the absence of mammalian hosts other than man, may die out in places where it flourished years ago. The fact that no cases of trypanosomiasis have been detected amongst the fishermen on the Islands lends

additional support to the view that, at all events under carefully controlled conditions, cyclically carried parasites do not constitute a danger to the community.

The question of the introduction of human trypanosomes from adjoining infected areas is, however, much more pressing. Duke remarks on the present lack of uniformity for the control of human trypanosomiasis on the shores of Lake Victoria among the three Protectorates whose territories border on the Lake.

W. Y.

DUKE (H. Lyndhurst); LLOYD (Ll.) & JOHNSON (W. B.). **The Trypanosome Infections of Tsetse-Flies in Northern Nigeria and a New Method of Estimation.** [Correspondence.]—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. June 19. Vol. 18. No. 3. pp. 142–144 [2 refs]; Oct. 23. No. 4. pp. 225–227 [2 refs.]

Duke commented on certain points raised in Lloyd and Johnson's paper on the trypanosome infections of tsetse flies in Northern Nigeria (this *Bulletin*, Vol. 21, p. 760). He raised the question of the presence of trypanosomes of the *gambiense-brucei* group in the labial cavity, and considered that the technique employed by Lloyd and Johnson (killing the flies by pressure on the thorax) affords a simple mechanical explanation of the presence of proventricular flagellates in the labium and that such forms have no developmental significance. Lloyd and Johnson agree that this is possible, but not likely, and think that the forms described by them were simply migrating forms travelling from the gut to the salivary glands. These authors consider that it is not safe to refer all trypanosome infections to their groups by inference from the location of the trypanosomes in the fly alone without some reference to their morphology.

The remainder of the correspondence is concerned with the relative merits of the methods of fly dissection adopted.

W. Y.

LLOYD (Ll.) & JOHNSON (W. B.). **Notes for Demonstration of Properties illustrating the Diagnostic Characters of the Flagellate Parasites of Tsetse-Flies.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Nov. 20 & Dec. 11. Vol. 18. Nos. 5 & 6. pp. 243–246. With 4 figs. on 2 plates.

At the Laboratory Meeting of the Royal Society of Tropical Medicine, the authors exhibited preparations illustrating the developmental stages of the various trypanosomes found in Glossina in Nigeria. An account of this work has already been published and noticed here (this *Bulletin*, Vol. 21, p. 760). The note is illustrated by two plates showing in a very clear manner the developmental stages of the various trypanosomes in Glossina.

W. Y.

GUILLET (R.). **A propos d'un suc ganglionnaire particulièrement riche en** *Trypanosoma gambiense.*—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 116–117. [5 refs.]

A native hospital patient, aged 45, was sent to the Dakar Pasteur Institute for microscopic examination for trypanosomiasis. Apart from some emaciation, sense of fatigue and lumbago, there were no symptoms, but it was noted that there was definite cervical adenitis.

On puncturing one of the glands, the juice showed "une véritable culture de trypanosomes"; in each microscopic field (oc. 4, obj. 7) 14 flagellates were counted. The author remarks that in his large experience he has never seen anything approaching this number of trypanosomes in gland juice.

W. Y.

KOPKE (Ayres). **Tratamento da doença do sôno.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a, 7a e 8a Sessões.) 1923. Aug. No. 4. pp. 51–61.

The author gives an interesting summary of the various stages through which the treatment of sleeping sickness has passed in his hands since 1901. At first he employed mercury, by mouth and by inunction, then arsenic, and, later, lysol intrathecally, and subsequent to this, atoxyl. He gives details of seven cases treated by the last-named since 1905, and concludes that when it is given hypodermically the results are good and cure effected if the trypanosomes have not invaded the central nervous system. When this has occurred neither atoxyl, 606, galyl, 914, nor tartar emetic averts the fatal issue. He has not had sufficient personal experience with "Bayer 205" to draw any definite conclusions as to its efficacy.

H. Harold Scott.

RODHAIN. **L'émétique et l'atoxyl dans le traitement de la trypanosomiase.**—*Bull. Méd. du Katanga.* 1924. Oct. Vol. 1. No. 5. pp. 185–187.

Rodhain addressed a circular letter to the Medical Officers of the Congo, in which he summarized what he regards as the main points in the treatment and prophylaxis of trypanosomiasis.

Treatment by atoxyl alone.

Patients in good condition and in the first stage of the disease generally tolerate well 1 gm. of atoxyl weekly. As a rule, the author has given an uninterrupted series of 12 to 19 of such weekly injections, and it is but rarely that it has been found necessary to stop the injections owing to ocular trouble. The number of injections can, however, without disadvantage, be reduced to 10. This is considered to be the most convenient method of prophylactic treatment, and it gives a proportion of permanent cures which have been estimated to be not less than 35 per cent. In patients especially sensitive to arsenic the weekly dose should be reduced to ·75 or ·8 gm. Patients in the second stage of the disease tolerate smaller doses, and it is advised in these cases that the dose should not exceed ·75 gm. As a routine treatment, a weekly dose of ·5 or ·6 gm. is best, and the majority of cases tolerate well such doses for an indefinite period, but treatment should be immediately suspended on the development of any visual trouble. On the whole, the author prefers subcutaneous or intramuscular injections to intravenous.

Treatment by emetic alone.

Weekly injections of ·1 gm. of emetic suffice to maintain peripheral sterilization, but they do not effect a cure even in recent cases. For this, 10 or more consecutive injections are necessary, and this is only practicable in hospitals. In the field the drug should be used only when visual disturbances have followed the administration of arsenic.

Treatment by emetic and atoxyl.

When it is possible to give two injections weekly, it is advantageous to combine atoxyl with emetic, patients in the first stage being given 1 gm. of atoxyl and ·1 gm. of emetic, and those in the second stage ·5 gm. of atoxyl and ·1 gm. of emetic. Such injections spaced at intervals of three or four days are well tolerated.

In conclusion, the author refers to another method of treatment, which consists in giving atoxyl ·5 gm. on the first day, emetic ·1 gm. on the second day, and atoxyl 1 gm. on the third day. This is advisable in the case of patients who are discovered on a first prophylactic tour, and who are not likely to be seen again for two or four weeks. It produces longer peripheral sterilization, and may in early cases lead to permanent cures.

W. Y.

MORGAN (Hugh J.). **A Case of Trypanosomiasis treated with Tryparsamide.**—*Amer. Jl. Med. Sciences.* 1924. June. Vol. 167. No. 6. pp. 827–835. With 1 chart. [10 refs.] And *Studies from the Rockefeller Inst. for Med. Res.* Reprints. Vol. 51. pp. 487–497.

The patient, a white woman aged 41, apparently contracted trypanosomiasis in the Belgian Congo in October, 1919. Trypanosomes (*T. gambiense*) were found in the blood, gland juice and cerebrospinal fluid in July, 1922. She was given three doses of atoxyl and, subsequently, 10 doses of "Bayer 205." In December, 1922, she was symptomless except for slight asthenia and anorexia. In June, 1923, a relapse occurred with well-marked nervous symptoms, but the blood, gland juice and cerebrospinal fluid were negative, although 30 cells per cmm. and globulin were found in the spinal fluid.

On March 20, 1923, tryparsamide 2 gm. was given intravenously with remarkably beneficial results; subsequently up to May 21, 9 further doses of tryparsamide were given, making 23·0 gm. in all. The improvement continued; on May 3rd the cerebrospinal fluid contained 20 cells per cmm., and a fair amount of globulin. The patient was discharged on May 24th, 1923, and returned for examination on July 5th. She had remained symptomless in the interval, and the cerebrospinal fluid showed on examination 12 cells per cmm., and some globulin.

W. Y.

CHESTERMAN (Clement C.). **The Therapeutic Effect of "Bayer 205" in Trypanosomiasis of the Central Nervous System.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Nov. 20 & Dec. 11. Vol. 18. Nos. 5 & 6. pp. 311–317. [7 refs.]

This paper embodies the results of research into the evidence of the degree in which "Bayer 205" reacts on the nervous system, which, the author states, in all probability is the *fons et origo* of a true relapse. It is obvious that information of this nature is essential before gauging the efficacy of a drug as a cure for trypanosomiasis. Information on this point is scanty and is briefly summarized. The author states that in his experience of over 600 cases, he has frequently noted that patients, who have received just enough of any drug to sterilize the blood, remain apparently fit for many months and then return, as a rule, much better than when they left, but examination of the

cerebrospinal fluid reveals a marked and progressive meningeal reaction. Chesterman considers that the only safe and reliable guide to the patient's condition is the cell and albumen content of the cerebrospinal fluid. Details are given of 17 cases. All were well advanced in the second stage of the disease. The 9 cases comprising Series I had received previous treatment with arsenicals, etc., but the 8 in Series II had not. The routine treatment was the intravenous administration of 1 gm. of "Bayer 205" repeated at weekly intervals. Examinations were made of the urine for the presence of albumen, but when it was realized that casts could always be detected by the microscope after centrifugation before the quantity of albumen was sufficient to be detected by trichloride acetic acid, this method was adopted. The author adds that had this been realized earlier, two cases would not have died of acute nephritis.

The records are not very encouraging. Two patients (Nos. 152 and 172) died of intercurrent bilharziasis and dysentery; two (Nos. 526 and 551) died of acute nephritis, and two (Nos. 164 and 483), who had suffered from amblyopia during their previous treatment with soamin, became completely blind after two injections of "Bayer 205." Eight patients (Nos. 170, 349, 422, 437, 552, 555, 557 and 564) returned in periods varying from six weeks to fifteen months and in a condition worse than when treatment was suspended. In four of these cases, this was confirmed by examination of the cerebrospinal fluid. In one of the cases (No. 552) the dose (3 gm.) was probably insufficient. One patient (No. 558), who remained with a cell count of 75 and ·02 per cent. of albumen in the cerebrospinal fluid, was treated with tryparsamide; after 12 gm. he was much improved, with 11 cells and ·01 per cent. of albumen in the cerebrospinal fluid, but the development of amblyopia precluded further doses.

The author remarks that possibly this early development of amblyopia was due to a diminished excretion of arsenic owing to damage to the kidneys by previous "Bayer 205." Finally, two cases (Nos. 468 and 550) were very much improved, but there has been no opportunity for re-examination, although there are reports that both are still alive four and five months respectively after treatment. The pathological findings in the cerebrospinal fluid after a course of "Bayer 205" are summarized in a table, which, as the author says, is frankly disappointing.

W. Y.

HANINGTON (John). **Notes on the Treatment of Human Trypanosomiasis by "Bayer 205."**—*Nigeria Ann. Med. & San. Rep. for the Year 1923.* Appendix IV. pp. 42–45.

A summary is given of the results of treating 132 cases of trypanosomiasis at Sherifuri, Northern Nigeria. Most of the patients were of early middle age. The disease in the endemic area in question, which follows the Kiawa River from the Bauchi Hills to Sokwa, is not of the mild form usually associated with West Africa, but runs a rapidly fatal course; when it becomes established in a hamlet the population is decimated, and then the site is abandoned.

Details are given of a number of cases which were diagnosed early and then treated with "Bayer 205." So far as possible the subsequent history of all the cases has been followed, and in this the Political Officers of Hadeija and Katagum rendered every assistance; but keeping track of cases drawn from such a large and scattered area is extremely difficult.

Up to the end of July, 1924, 15 deaths have been recorded from the 132 cases seen; 4 of these received no "Bayer 205"; 8 were brought into the camp in the last stage of the disease; one small boy decamped after his second injection and was reported to have died a month later from cerebrospinal meningitis; one patient who was brought to the camp in an advanced stage of the disease and received only a single injection apparently recovered, but died of what was presumably sleeping sickness nine months later; and the last case—a small girl—received three injections, returned to her village, and died of some unknown cause a month after the last injection.

The following statement summarizes the treatment given and the deaths recorded:—

18 cases received no "Bayer 205," and 4 died.
25 received 1 or 2 doses, and 6 died.
73 received 3 to 5 doses, and 2 died.
16 (whose sickness responded less readily to the drug), received from 6 to 10 doses, and 3 died.

The conclusion is:—

Finally, from our experience, "Bayer 205" appears to be the most efficient drug yet produced for African Sleeping Sickness. Although death has in some cases occurred in spite of it, there has been no case where very marked improvement did not follow its use. Its employment has produced no untoward results, except the transitory albuminuria. The brevity of its course is one of its great advantages, as no native will remain of his free will for a protracted treatment. The drug keeps well in the tropics, and its administration is exceedingly simple.*

W. Y.

LUENGO (E.). **Nuevas investigaciones en un caso mortal de tripanosomiasis humana tratado por el "Bayer 205."**—*Arch. Inst. Nac. Higiene de Alfonso XIII.* 1924. Oct. Vol. 3. No. 3. pp. 203–209. [2 refs.]

The further history of an interesting case is described in which, in spite of the effect of "Bayer 205" in causing the disappearance of trypanosomes from the blood time and again, the parasites reappeared and the patient eventually succumbed to the disease. Injections in doses of 1 gm. led to marked and rapid general improvement, but temporarily only. At the autopsy the only changes found were a limited degree of meningo-encephalitis, enlargement of the spleen and of the mediastinal and tracheo-bronchial lymphatic glands. The author is of opinion that this drug seems to modify the evolution of the trypanosome in such a way that instead of the disease progressing slowly it does so by intermittent exacerbations, and that actual cure of the disease and destruction of the trypanosomes are only possible when they have not yet succeeded in invading the nervous tissues.

H. Harold Scott.

NAUCK (E.). **Untersuchungen ueber die Wirkung des Trypanosomenheilmittels "Bayer 205."** [Investigations on the Action of "Bayer 205."]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 1. pp. 1–16. [12 refs.]

With a view to obtaining some insight into the mode of action of "Bayer 205," the author performed a number of experiments from the results of which he draws the following conclusions:—

* In these cases *G. tachinoides* seems to have been the carrier.—ED.

1. The mode of action of "Bayer 205" is to be regarded as a complicated process consisting of various factors.

2. In addition to a possible action on the whole organism of the treated animal, which leads to an alteration in the condition of existence for the parasite, thereby depriving it of a suitable medium, there is undoubtedly a direct action on the trypanosome cell.

3. Even short contact of the parasite-cells with "Bayer 205" in the test-tube, or in the peritoneal cavity of mice, or better still, in the peripheral blood of rabbits, damages the parasite so that even though they are not immediately killed, they have lost the power of reproduction, and become avirulent.

4. This direct damage takes place more quickly and intensely in the animal organism than in the test-tube.

5. "Bayer 205" is bound to the trypanosome cells and is not removed by prolonged sojourn in physiological saline or by frequent washings and centrifuging.

6. The drug is not stored up in the red corpuscles and is readily given up by these cells on washing in saline.

7. The direct activity of "Bayer 205" in the organism is superior to that of atoxyl or tartar-emetic.

W. Y.

COLLIER (W. A.). **Untersuchungen über die Festigung von Tsetse-trypanosomen gegen Bayer 205 und Arsenikalien.** [The Resistance of Tsetse-trypanosomes to "Bayer 205" and Arsenicals.]—*Arb. a. d. Staatsinstitut f. Experim. Therap. u. d. Georg Speyer-Hause zu Frankfurt a.M.* 1924. No. 17. pp. 26–31. [2 refs.]

The following are the conclusions :—

1. A resistance of nagana in mice against "Bayer 205" is possible within a short period.

2. Resistance against "Bayer 205" in mice which have been previously treated with large doses of arsenobenzol derivatives produces strains which are at the same time more or less resistant to arsenicals, antimony, triphenymethane dyes, azo dyes and acridin dyes.

3. Trypanosomes can also become resistant to arsenicals when they are maintained in mice which some time previously have been treated with large intravenous doses of arsenobenzol.

4. Since "Bayer 205" circulates for a long time in the blood, one must, in view of the above facts, consider the possibility that sooner or later a condition may arise in which, although the active substance is still present in the organism, its concentration does not suffice to kill off the developing trypanosomes. This is just as important for the employment of a drug as a prophylactic, as it is for the choice of doses in treatment.

W. Y.

LEUPOLD (Frida). **Gewinnung und Eigenschaften von "Bayer 205"-festen Trypanosomenstämmen.** [The Production and Properties of "Bayer 205" Resistant Strains.]—*Arb. a. d. Staatsinstitut f. Experim. Therap. u. d. Georg Speyer-Hause zu Frankfurt a.M.* 1924. No. 17. pp. 19–25.

The following summary is given :—

1. Drug resistance in trypanosomes which were originally highly sensitive to "Bayer 205" is easily obtainable if infected animals are treated with small doses and the relapse strains habituated to higher doses.

2. Trypanosomes resistant to arsenic, tartar emetic and trypaflavin are less highly influenced by "Bayer 205" than normal strains. They also become more quickly resistant to the drug than do normal strains.

3. Trypanosomes resistant to trypanblue are completely resistant to "Bayer 205."
4. A strain resistant to trypaflavin and arsenicals loses through resistance to "Bayer 205" its insensitiveness to arsacetin, and becomes even more sensitive to trypaflavin than before.
5. Treatment of nagana-infected animals with "Bayer 205" lessens the virulence of the acutely fatal strain and reduces it to a chronic infection with single well-separated paroxysms.
6. The rapidity with which resistance appears, and the tendency to a chronic relapsing course, permit a comparison with the action and the point of attack of di- and tri- phenylmethane dyes and with benzidin dyes.

W. Y.

PINTO (Cesar). **Doença de Chagas na Argentina.**—*Sciencia Medica.* 1924. Oct. 31. Vol. 2. No. 10. pp. 546–547.

The author comments on the paucity of cases of Chagas' disease in the Argentine recorded by previous observers, and cites a case of the cardiac form in a patient from whom 10 cc. of blood were taken and inoculated into a guineapig. Trypanosomes did not appear in the peripheral blood till 43 days later. It would seem, therefore, that cases are more frequent than is generally believed, since the results of inoculation experiments have been recorded as negative owing to the animals not having been examined for a sufficiently long period, or from comparatively refractory animals having been employed. Puppies, kittens, guineapigs and monkeys are more susceptible than rats.

H. Harold Scott.

VILLELA (Eurico) & BICALHO (Chagas). [In Portuguese & English.] **As pesquisas de laboratorio no diagnostico da Molestia de Chagas. Laboratory Tests in the Diagnosis of Chagas' Disease.**—*Mem. Inst. Oswaldo Cruz.* 1923. Vol. 16. No. 1. In Portuguese pp. 13–29. With 6 plates. [10 refs.] In English pp. 31–46.

In this paper the authors discuss the various means of diagnosing Chagas's disease. Dealing first with the examination of the blood, they mention direct examination of fresh and stained preparations and the triple centrifugation method. These methods are suitable for the acute form of the disease, but in the chronic cases the blood is generally negative. The inoculations of dogs, cats, marmosets and guineapigs are also useful in acute cases. Positive results were obtained by the inoculation of guineapigs in 26 per cent. of acute cases. Zeno-diagnosis is not of much practical importance, not only on account of the time required, but also because the recent work of MAYER indicates the possibility of hereditary transmission of the parasites in the bugs. The authors then consider at some length the complement fixation test, and record a considerable number of observations from which the following conclusions are drawn :—

1. The complement fixation is the most practical and most sensitive of laboratory tests for the diagnosis of the chronic forms of Chagas' disease.
2. The antigen prepared with the aqueous extract of heart and spleen of infected animals (puppies) is strictly specific.
3. A mixed glycero-aqueous extract of heart and spleen offers the greatest number of advantages.

4. The value of the antigen appears to be proportionate to the parasitic infestation of the organ, so that it is advisable to make a previous examination of the organ used.

5. The aqueous extract of organs of animals (puppies) not infected with *Trypanosoma cruzi* does not furnish a complement-fixing antigen.

6. There is no correlation between the Wassermann reaction and a complement-fixation test in Chagas' disease: results of these tests are entirely independent.

7. The strict specificity of the test must be accepted with reserve as regards other trypanosomiases, on the one hand, and antigens prepared with other trypanosomes on the other.

W. Y.

VILLELA (Eurico). **Varação do poder pathogenico do "Tripanosoma cruzi" (raça neurotropica).**—*Sciencia Medica.* 1925. Feb. 28. Vol. 3. No. 2. pp. 147–148. With 1 fig.

The author obtained a strain of *T. cruzi* from an armadillo which had a greater virulence than the usual human strains, and this was raised still higher by passage through guineapigs and puppies. Inoculation into adult dogs produced staggering, convulsions and paralysis in 20-25 days, and death within six weeks. The trypanosome from a human source might take 30-40 days or more before any symptoms appeared, and, though by passage through guineapigs and young dogs this incubation period could be reduced, it never reached even half that of the armadillo strain.

Two dogs were inoculated on the same day with equal amounts of blood from guineapigs, one infected with a human and one with the armadillo strain. Twenty-nine days later that injected with the former was lively, though becoming thin, that with the latter was completely paralytic. Two others were similarly infected. Three weeks later the one infected with the human strain showed a little weakness and loss of weight, the other was definitely paralytic; both showed trypanosomes in the peripheral blood. The difference between the two strains was very marked, and that from the armadillo appeared to be particularly neurotropic.

H. Harold Scott.

ROSENTHAL (F.) & SPITZER (Fr.). **Weitere Untersuchungen ueber die trypanoziden Substanzen des menschlichen Serums. V. Mitteilung. Die Bedeutung des Retikuloendothels für den Mechanismus der trypanoziden Wirkung des Menschenserums.** [Further Investigation on the Trypanocidal Substances in Human Serum. The Significance of the Reticulo-Endothelium for the Mechanism of the Trypanocidal Activity of Human Serum.]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1924. Aug. 12. Vol. 40. No. 6. pp. 529–551. With 1 chart in text. [13 refs.]

This interesting paper is a continuation of previous work by Rosenthal along the same lines, and deals with similar matter to one published elsewhere, and previously noticed here (this *Bulletin*, Vol. 22, p. 143).

The conclusions are :—

1. In aleucocyte animals [blood rendered free from leukocytes by treatment with Thorium X.] human serum exerts no trypanocidal action.

2. Iron blocking of the reticulo-endothelium alone is often sufficient to diminish considerably the trypanocidal effects of human serum. A definitely greater diminution is produced by extirpation of the spleen; whilst the combination of the two decreases the effect in a pronounced degree.

3. Experiments have shown that the macrophage system of the body plays a most important part in the mechanism of the trypanocidal action of human serum, and that the human serum which *in vitro* is inactive to trypanosomes is activated by the reticulo-endothelium system when introduced into the animal organism.

W. Y.

GRÜNMANDEL (S.) & LEICHTENTRITT (B.). **Der Gehalt des kindlichen Serums an trypanozider Substanz. Zweite Mitteilung. Untersuchungen bei Keratomalazie und ödematösen Zuständen. Dritte Mitteilung. Untersuchungen beim kindlichen Skorbut und den ihm verwandten Zuständen.** [The Content of Trypanocidal Substance in Children's Serum. Investigations in Ulceration of the Cornea and Oedematous Conditions and Infantile Scurvy.]—*Jahrbuch f. Kinderheilk.* 1924. July. Vol. 106. No. 4. pp. 203–214. [18 refs.]; pp. 215–226. [17 refs.]

I. Reference is made to a previous paper by LEICHTENTRITT and ZIELASKOWSKI in which it was shown that in a number of pathological conditions of young children the content of trypanocidal substances in the serum gives information concerning the defensive power of the organism (this *Bulletin*, Vol. 20, p. 337).

It has for some time been an axiom with the authors that in conditions which are dependent on a lack of vitamins the trypanocidal action of the serum is decreased or even absent.

Investigations were first made on children suffering from corneal ulcers, a disease which, in 1923, reached unprecedented proportions owing to the lack of high grade fats and the poor quality of milk. All the cases showed complete absence of trypanocidal substance. Even ·4 cc. of serum gave no protection when injected into experimentally-infected mice. The authors consider that there is probably no other disease in which the trypanocidal substance disappears so completely. The prognosis is correspondingly bad. Only one of the seven young children between eight weeks and fourteen months recovered, and in this case within a month of the onset of clinical improvement the serum had regained its trypanocidal activity. A similar result was obtained in the case of two older children.

In children suffering from alimentary oedema due to improper dietary and complicated by secondary infections similar observations were made.

II. The authors draw attention to the great strides that have been made during recent years in knowledge of the pathogenesis of infantile scurvy. MEYER has postulated a scurvy diathesis and with this the authors agree. They point out that the great majority of children suffering from Barlow's disease are constitutionally defective. Dietary and various infections are, of course, important, but the essential predisposing cause is constitutional.

Certain infections are known to be instrumental in precipitating Barlow's disease, e.g., dysentery and whooping cough. Blood can often be found in the stools of children suffering from scurvy, and

RATNOFF has found blood in 75 per cent. of his cases of icterus neonatorum. RATNOFF traces a parallel between this disease and scurvy, and assumes that in both the arterial reticulo-endothelium is undeveloped. The authors reached the same conclusions during their investigations into the trypanocidal substance of the serum of children.

The authors discuss a number of conditions in which diagnosis is difficult, and the opinion is expressed that examination of the trypanocidal activities of the serum may be useful in these cases.

W. Y.

DUKELSKY (Olga). **Ueber die Neutralisierung des Anaphylatoxins durch Salvarsan in Verbindung mit der Pathogenese der Todesfälle bei Trypanosomenerkrankungen.** [On the Neutralization of Anaphylatoxin by Salvarsan in Relation to the Pathogenesis of Fatal Cases in Trypanosomal Disease.]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1925. Feb. 16. Vol. 42. No. 2. pp. 113–122. [13 refs.]

Experiments with infected mice have shown that the injection of salvarsan usually results in cure even when the animals are in a very advanced stage, with parasites about as numerous as the erythrocytes. On the contrary, similar experiments with other trypanocidal bodies, e.g., "Bayer 205," have given quite different results: when this drug is given at a time that the blood contains very numerous parasites death occurs in a few hours, although the number of parasites has decreased. To explain this difference, it is necessary to have some insight into the factors which lead to death in this disease. Various theories have been advanced, but these are not very satisfactory, and the author believes that the whole symptom-complex resembles very closely anaphylactic shock, which could in this case be explained by the action of an anaphylatoxin formed by the trypanosomes in the blood. A considerable number of experiments are recorded, from which the author draws the following conclusions:—

1. Attempts to neutralize the anaphylatoxin *in vitro* by means of salvarsan lead mostly to positive results.
2. The clinical symptom-complex and the quick occurrence of death in acute trypanosomiasis recall an anaphylactic shock. This circumstance and the rapid improvement of the animal after salvarsan administration permit the conclusion that the anaphylatoxin formed by the action of the trypanosomes which cause the symptoms and death is neutralized *in vivo* by salvarsan in a manner similar to that which takes place *in vitro*.
3. The power of salvarsan to neutralize anaphylatoxin is dependent on its high physico-chemical activity.

W. Y.

MORRISON (Henry). **The Serum-Formalin Reaction in Human Trypanosomiasis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Oct. 23. Vol. 18. No. 4. pp. 214–216. [3 refs.]

The serum-formalin reaction was examined in a series of 20 patients of whom 10 suffered from trypanosomiasis and the remainder from other diseases, e.g., dysentery, malaria, smallpox, relapsing fever. The results are summarized in a table. The reaction was positive in 6 hours in nine cases of trypanosomiasis, in the remaining case after 48 hours. Of the 10 other cases one was positive after 6 and three after 24 hours.

The author concludes (1) that the percentage of positives among the cases other than trypanosomiasis is too high to admit of a definite diagnostic value being placed on the reaction, (2) that these natives who had always resided in the area might have suffered from trypanosomiasis and recovered, (3) that the treatment by Bayer 205, which all the trypanosomiasis cases underwent, may have influenced the reaction. Seeing that the test was positive in three apparently cured trypanosomiasis cases he wonders whether or not after definitive cure it becomes negative.

W. Y.

BATTAGLIA (Mario). **Ueber Infektion mit einigen menschlichen und tierischen Protozoen.** [Infection with some Human and Animal Protozoa.]—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Oct. 15. Vol. 92. No. 7/8. pp. 540–542. [15 refs.]

As the result of a series of experiments on small and medium sized animals infected with various trypanosomes, e.g., *T. lewisi*, *T. brucei*, *T. dromedarii*, *T. gambiense* and *T. vespertilionis*, the author concludes that the trypanosomes begin their development in an amoeboid sporephase, and that atoxyl does not cure trypanosomiasis because it only acts on the flagellate forms leaving the spores and amoeboid forms intact.

W. Y.

i. TANON (L. & JAMOT (E.). **Valeur du B.205 dans le traitement de la trypanosomiase humaine au Cameroun.**—*Bull. Acad. Méd.* 1925. Apr. 14. Year 89. 3rd Ser. Vol. 93. No. 15. pp. 394–397.

ii. VAN HOOF (L.). **Thérapeutique de la maladie du sommeil et des trypanosomiases animales africaines.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a, 7a, e 8a Sessões.) 1923. Aug. No. 4. pp. 87–128. With 2 plates. [104 refs.]

iii. LEJEUNE (E.). **La prophylaxie de la maladie du sommeil.—Son organisation au Congo Belge.**—*Ibid.* pp. 177–229. [13 refs.]

iv. KOLLE (W.). **Ueber den chemotherapeutischen Wirkungsvorgang und die Arzneifestigkeit bei Bayer 205 und anderen chemischen Stoffen.** [The Mechanism of the Chemotherapeutic Action of Drug Resistance in Bayer 205 and Other Chemical Bodies.]—*Arb. a. d. Staatsinstitut f. Experim. Therap. u. d. Georg Speyer-Hause zu Frankfurt a.M.* 1924. No. 17. pp. 3–18. [1 ref.]

i. This paper is similar to one previously published elsewhere and already noticed [this *Bulletin*, Vol. 22, p. 136].

ii. In this paper, which is of a general nature, the author discusses briefly the value of a very large number of drugs which have hitherto been used in the treatment of trypanosomiasis.

iii. The author gives a description of the anti-sleeping sickness organization which has been set up in the Belgian Congo; it should be consulted in the original by those interested.

iv. A paper of a technical nature which should be consulted by those who are interested in the original.

W. Y.

FISCHER (W.). **Die afrikanische Schlafkrankheit (Trypanosomiasis hum.) und ihre Bekämpfung unter besonderer Berücksichtigung der Deutschen Schlafkrankheits-expedition 1921-24.**—*Muench. Med. Woch.* 1925. Apr. 24. Vol. 72. No. 17. pp. 684–687.

TANON & JAMOT. **La maladie du sommeil au Congrès de Loanda.**—*Ann. d'Hyg. Publique, Industrielle et Sociale.* 1924. Feb. Vol. 2. New Ser. No. 2. pp. 107–113.

REVIEW OF PELLAGRA LITERATURE.—II.*

During the last two or three years the volume of literature dealing with pellagra has diminished considerably. Coincident with this, apparently, there has been a decrease in the number of cases reported. The reasons for these facts are not far to seek. During the Great War and the period immediately following it two unusual factors were in operation: (1) A collecting together of individuals into large groups in a highly artificial manner, so that in many of these bad feeding, overcrowding, and diseases of various kinds were only too prevalent; (2) The presence in various parts of the world, previously unknown to them, of numerous medical officers anxious to make the war years medically interesting by the study of the fresh clinical pictures presented to them. The harvest, indeed, was plenteous, and the labourers eager and well trained. Nevertheless, even with the disappearance of the above factors, cases in new areas and new cases in old areas have been reported, and with these the first section of the present review deals.

Pellagra is unknown, or at any rate extremely rare, on the Gold Coast. A case is reported by COOKE[1] of a male convict, aet. 30, in the prison at Accra. The man had been incarcerated for nine months, and no other cases were noted. The author does not attempt an etiological explanation.

Eight, more or less typical, cases are reported from the University Clinic of Tokyo by ITO.[2] Here, too, no adequate etiological factors are given in the histories, but the fact that three of the cases had been, or actually were, suffering from beriberi suggests some defect in diet. From Kenya Colony comes a record of a case published by NAIR.[3] The patient, a native aged 35, suffered from three attacks of a pellagra-like rash accompanied by soreness of the tongue. No further details are given, so that the author must be left in the condition revealed by the last sentence of his note: "Now I wonder what the patient is suffering from if it is not pellagra." HEAD[4] claims that the case reported by him is the first recorded in South Dakota. A woman, aged 50, owing to dental trouble, had eaten no meat for two years, and had lived upon "soft mushy foods." From the clinical description, illustrated by beautiful coloured plates, there can be little doubt that the case was one of true pellagra. This diagnosis was confirmed by Dr. GOLDBERGER.

As regards the incidence of pellagra in asylum practice it would appear that in many institutions the disease must be overlooked, since in some it is practically endemic. More particularly is this true of the Lancashire County Mental Hospital at Rainhill, where WATSON[5]

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* For the first of this series see Vol. 21, pp. 523–526.

[1] COOKE (Francis H.). A Short Report on a Case of Pellagra in the Convict Prison, Accra, Gold Coast.—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Oct. 23. Vol. 18. No. 4. p. 219.

[2] ITO (M.). Ueber Pellagra, resp. Pellagroid in Japan und ihre Behandlung mit Reiskleienextrakt. [Abstract.]—*Japan Jl. Dermat. & Urol.* 1924. Mar. Vol. 24. No. 3. pp. 21–29. [In Japanese pp. 240–302. With 32 figs. 110 refs.]

[3] NAIR (T. D.). A Probable Case of Pellagra.—*Kenya Med. Jl.* 1924. Apr. Vol. 1. No. 1. pp. 20–21.

[4] HEAD (George Douglas). A Case of Pellagra—its Bearing on the Etiology and Cure of the Disease.—*Arch. Intern. Med.* 1924. July 15. Vol. 34. No. 1. pp. 93–96. With 5 text figs. [9 refs.]

[5] WATSON (G. A.). Pellagra.—*Tenth Ann. Rep. Board of Control for* 1923. *Lunacy & Mental Deficiency.* p. 81. 1924. H.M. Stationery Office.

reports two new cases, thus bringing the total number of cases here recorded since 1913 up to 53. Both cases proved fatal in a few weeks. The workers in this hospital are convinced that no food deficiency can account for the condition. At Cane Hill Mental Hospital, McCowan[6] records four cases during the last two years. These, however, are regarded as being essentially dietetic in origin, all of them having been improperly nourished previously owing to their refusal to take sufficient food.

The mystery of pellagra etiology, instead of becoming clearer, seems more baffling than ever, for more evidence is coming to light, tending to disprove the dietetic deficiency theory. Even the strongest supporters of this view do not help matters by constantly changing their ground concerning the substance or substances the absence of which brings about the disease. Thus Goldberger and Tanner,[7] having forsaken their recent amino-acid love, promptly turn their attention towards a still newer mistress, called by them "pellagra-preventing factor." In the conclusions to their latest paper the following are quoted :—

"(1) In the prevention (and presumably causation) of pellagra there is concerned a heretofore unrecognized or unappreciated dietary factor which we designate as factor P—P. *This may be effective with but little, possibly without any, co-operation from the protein factor.* [The italics are the reviewer's.] (2) Factor P—P may possibly play the sole essential role in the prevention (and causation) of pellagra. (3) Factor P—P is present in brewers' yeast, in milk and in lean beef; it is very low or lacking in dry Soy beans, dry cow peas, butter, cod-liver oil and canned tomatoes."

This P—P factor must, apparently, be regarded as a vitamin, and in this connexion it will be interesting to discuss shortly the work of other observers who regard pellagra as a manifestation of avitaminosis. Seale Harris,[8] though regarding diet as important in etiology, states that this is so only in so far as food deficiency, especially with low vitamin C content and carbo-hydrate excess, lowers bodily resistance. Ito[9] and Owensby,[10] on the other hand, regard vitamin B deficiency as the causal factor with the addition of, according to the latter observer, vitamin C deficiency as a contributory factor.

In contradistinction to the above we have Wheeler[11] taking up the old protein deficiency theory. He points out that those whose diet is upon the borderline of deficiency run the risk of contracting pellagra because any slight alteration in food, or even in mode of life, may suddenly render the diet insufficient. The paper in which this

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6 McCowan (P. K.). Pellagra: a Report of Four Cases with Histological Findings in One Case.—*Jl. Mental Science.* 1924. July. Vol. 70. No. 290. pp. 410–422. [12 refs.]

7 Goldberger (Joseph) & Tanner (W. F.). A Study of the Pellagra-Preventive Action of Dried Beans, Casein, Dried Milk, and Brewers' Yeast, with a Consideration of the Essential Preventive Factors Involved.—*Public Health Rep.* 1925. Jan. 9. Vol. 40. No. 2. pp. 54–80. [11 refs.]

8 Harris (Seale). The Food Factor in Pellagra.—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 709–719. [12 refs.] [United Fruit Company, Boston, Mass.]

9 Ito (Minoru). [On Pellagra, or Pellagroid in Japan.]—*Hifuka Hitsunyokika Zasshi (Jl. Dermat. & Urol.).* 1924. Mar. Vol. 24. No. 3. [Summarized in *Japan Med. World.* 1924. Oct. 15. Vol. 4. No. 10. p. 269.]

10 Owensby (Newdigate M.). Pellagra.—*Med. Jl. & Record.* New York 1924. Oct. 15. pp. 377–379. [8 refs.]

11 Wheeler (G. A.). Pellagra in Relation to Milk Supply in the Household.—*Public Health Rep.* 1924. Aug. 29. Vol. 39. No. 35. pp. 2197–2199.

view is expressed deals with the variation in one item of food, viz., milk, and its connexion with pellagra in the household. Three family cases are described in which, with the addition of milk, the diet was just safe, but with the withdrawal of this commodity, for one reason or another, pellagra developed. It is interesting to note that the interval elapsing between the beginning of the diet defect and the appearance of symptoms of the disease was in every case three to three and a-half months.

In the opinion of the reviewer one of the strongest arguments against the food deficiency causation of pellagra is the great rarity of the disease in general hospitals, where there are always a few cases being slowly starved to death as the result of disease. Ever since the war one has particularly observed such cases, but so far with negative results. The paper of BENDER[12] is of particular interest in this respect. He, too, remarks upon the paucity of cases of pellagra associated with organic defects of the stomach, etc. In the literature he was only able to find two such cases: (1) Quoted by ROLPH, in which a woman, suffering from dysphagia and vomiting for seven months as a result of carcinoma ventriculi, four months before her death developed pellagra; (2) A case quoted by BRYAN, in which symptoms of peptic ulcer had been present for 20 years with increasing vomiting so that during the last four months very little food had been retained. At operation a gastric carcinoma was discovered and a gastro-enterostomy performed. As a result the symptoms were relieved, and in two months the pellagra manifestations also had disappeared. To these cases BENDER adds three of his own. In the first pellagra developed "during a period of jejunal feeding necessitated by deformity of the stomach by a benign ulcer." Cure of the ulcer resulted in the disappearance of pellagra. The remaining two cases were due to progressive carcinomatous destruction of the stomach. GOLDBERGER and TANNER are quoted as having had a case similar to No. 1 in this author's series.

In the recent literature two more cases of somewhat similar etiology are recounted. Thus, CORLETTE[13] had under his care in Australia a patient who for some time had been suffering from hydatid disease of the liver. Later, an abscess formed in the liver which penetrated the lung, giving rise to septic symptoms and emaciation. A fairly typical mild pellagra developed, probably as a result of the cachexia. Great improvement followed the draining of the liver abscess. LANZARINI[14] describes a case associated with multilobular cirrhosis of the liver.

Before turning to the purely pathological section of the review, mention must be made of the work of WATSON[15] and the bearing of his pathological researches on the question of pellagra etiology. This observer is in the almost unique position of being a world famous expert upon cerebral pathology and having at the same time a thorough knowledge of pellagra both clinically and pathologically. Naturally, he views the subject from a different angle from most other workers,

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12 BENDER (William L.). Pellegra Secondary to Lesions of the Stomach interfering with Nutrition.—*Jl. Amer. Med. Assoc.* 1925. Apr. 25. Vol. 84. No. 17. pp. 1250–1252. With 1 text fig. [9 refs.]

13 CORLETTE (C. E.). On Pellagra: with an Account of a Case.—*Med. Jl. Australia.* 1924. June 21. 11th Year. Vol. 1. No. 25. pp. 613–617.

14 LANZARINI (Felice). Considerazioni cliniche sopra un caso di cirrosi epatica pellagrosa senza ascite.—*Gaz. d. Ospedali e d. Cliniche.* 1924. May 18. Vol. 45. No. 20. pp. 462–466.

15 WATSON (G. A.). Personal communication.

and he attempts to deduce the etiological factors of the disease chiefly from the pathological appearances met with in the central nervous system. It is generally agreed that the typical change in this region is a condition called by Adolf MEYER in 1901 Central Neuritis. Here the nerve cells show chromatolysis, excentricity of the nucleus, etc., the result of a degeneration of an axonal type, i.e., one resembling the appearance of a nerve cell when its axone is damaged peripherally. It is important to realize that this change is a degenerative one, and in no respect of an inflammatory nature. In pellagra this central neuritis shows itself particularly in certain cells of the cortical layers, i.e., in the larger cells, and to a less degree in the anterior cornual cells of the cord, and in the cells of Clarke's column. Granted, then, that central neuritis is the typical nervous lesion in pellagra, does this fact throw light upon the etiology of the disease? WATSON is of the opinion that the answer is certainly in the affirmative since the nature of the lesion and its cortical distribution is definitely against any inflammatory basis or protozoal origin.

"In explanation of the liability of certain sets of neurones to be especially involved in pellagra (and the same applies to central neuritis) it seems necessary to assume that in patients who suffer from these conditions there is an inherent instability in such neurones which renders them the more readily liable to be affected by metabolic disturbances, and these are just the neurones, on account of their size, in which metabolic exchanges are most difficult." Such metabolic disturbance is probably associated with lack of endocrine balance since "both central neuritis and pellagra occur in the majority of mental hospital cases somewhere about the climacteric, when endocrine disturbance is apt to occur, presumably of gonad origin, and more common in females. The minority cases are nearly all, if not all, cases of dementia praecox in which there is certainly often, and probably always, very definite evidence of endocrine imbalance."

That there is an association between central neuritis and pellagra is a fact; that the cause of both is an endogenous toxin acting through the agency of the endocrine system upon neurones of inherent instability is certainly a possibility. One has only to consider the clinical appearances which would be presented by a case of Addison's disease associated with central neuritis to grasp the significance of WATSON's theory.

Turning now to the purely pathological side of our subject perhaps the most interesting paper is that by PIERCE.[16] This worker carried out exhaustive post-mortem studies, particularly on the nervous system, on a female pellagrin whose case was not complicated by the presence of any other psychosis. In addition to central neuritis affecting most of the Betz cells, less noticeably the large pyramidal cells in the inner cortical layer and not at all the Purkinje cells of the cerebellum, there was marked cortical gliosis. A discussion followed the reading of this paper, in which Dr. Adolf MEYER took part. In his remarks he stated that all the cases of central neuritis he could remember had a tendency to refuse food and had to be fed by a spoon or tube. Dr. GREGORY gave it as his opinion that in the Northern States of America, or at any rate in his own cases, the initial picture was one of central neuritis followed later by dermatitis and intestinal symptoms, while in the South, apparently, central neuritis was regarded as a terminal event in pellagra.

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[16] PIERCE (Lydia B.). Pellagra. Report of a Case.—*Amer. Jl. Psychiatry.* 1924. Oct. Vol. 4. (Old ser. Vol. 81.) No. 2. pp. 237–240. With 6 figs. [5 refs.]

DENTON[17] gives an account of interesting post-mortem results obtained in 12 cases located in the Panama Zone. The value of the findings is enhanced by the fact that in no case was death due to intercurrent affection. He regards the following features as diagnostic of pellagra at autopsy, viz.: (a) A brownish red colouration of the buccal and oesophageal mucous membranes, with or without small necrotic areas. This colour is due to telangiectases covered by a thin layer of epithelium; (b) a similar brownish red colouration of the small intestine; and (c) a colitis of peculiar degree and intensity. The changes in the nerve cells this author regards as being of the nature of a "by-product of the disease."

McCOWAN[6] reports upon three post-mortem cases occurring in asylum practice. His findings are in agreement with those of other observers.

The mechanism of the pigmentation in pellagra provides a constant source of discussion. When it is remembered that 50 per cent. of maize protein is zein, which is deficient in tryptophane and lysine, and that aromatic amino-acids absorb ultra-violet rays, the idea of DAWBARN[18] that when the diet lacks tryptophane this substance, not being found in the superficial layers of the skin, would allow the rays to attack the deeper layers, is certainly ingenious. However, experiments carried out with white mice to test this hypothesis gave a negative result.

As might be expected, the section of this review dealing with therapeutic measures is, as formerly, the least satisfactory. GOLDBERGER and TANNER,[7] realizing that their former pellagra-preventing diet was probably in excess of the minimum required, and was at the same time expensive, sought for substitutes. Soy beans, cow peas, casein and dried milk were found unsatisfactory. Brewers' yeast, however, was found extremely efficacious. This was given in the form of dry powder made by the Harris Laboratories, Tuckahoe, N.Y. The amount given to pellagrins with active symptoms was 50 gms. daily, reduced to 15 gms. when convalescence was established. This smaller dose was given also to milder active cases, and to those without any symptoms at all. Later it was found that 30 gms. was safer as a daily ration, and with less than this relapses occurred.

ITO[2] treated his Japanese pellagrins with rice husk administered in one of two forms: (*a*) Watery extract of rice husk 50 cc. per diem by mouth; and (*b*) oryzanin (a preparation of rice husk) in doses of 3–4·5 gms. a day. Apparently the treatment was most successful.

"A full diet, rich in vitamins, particularly B and C, with a low carbohydrate content, eliminating cane sugar entirely, is essential in the treatment of pellagra." (Seale HARRIS.[8])

In conclusion, it must be admitted that pellagra in etiology, in mechanism of symptom production, and in treatment, remains a mystery as inviolate as the cause of cancer, and as baffling as the nature of life itself.

A. Douglas Bigland.

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17 DENTON (James). The Pathology of Pellagra.—*Amer. Jl. Trop. Med.* 1925. Mar. Vol. 5. No. 2. pp. 173–210. With 14 text figs. [5 refs.]

18 DAWBARN (M. C.). The Negative Result of an Attempt to sensitize White Mice to the Action of Ultra-Violet Light by a Diet Deficient in Tryptophane.—*Australian Jl. Experim. Biol. & Med. Sci.* 1924. Sept. 15. Vol. 1. Pt. 3. pp. 73–75. [2 refs.].

YAWS.

RAMSAY (G. C.). **The Influence of Climate and Malaria on Yaws.**—*Jl. Trop. Med. & Hyg.* 1925. Feb. 16. Vol. 28. No. 4. pp. 85–86. [6 refs.]

In this paper Dr. Ramsay, writing from the Labac Central Hospital, Cachar, Assam, relates a number of interesting observations on yaws. He finds that the disease is commoner among those tribes which inhabit the mountainous regions (2,000–6,000 ft.) of the province than among the dwellers on the plain, and quotes Captain CANTLIE, who describes cases as common in the high country around Torit (1,000–5,000 ft.) in Mongalla in contradistinction to CASTELLANI and CHAMBERS who, it is said, state that the disease is not found above 800 ft. [That yaws is found at the higher altitudes is, of course, well known, *vide* SELLARDS, *Philippine Jl. Sci.* 1923. Vol. 22. No. 3; WENCKEL, *Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1923. Part 3; Reports from Kenya and Tanganyika Territory.]

The second observation is to the effect that the disease as seen in the plains in the warm weather is that described in text-books in the primary and secondary stages—widespread papular eruptions, furfuraceous desquamation, "framboesial" lesions and circinate forms, but that in the cold season these are rarely seen, while condyloma-like lesions in the warm, moist regions of the axilla and between the nates are found together with a chronic dermatitis of the hands and the worm-eaten appearance on the soles of the feet. With the return of the warm weather the florid eruption may reappear. The disease as seen in the hills approximates to the cold weather type of the plains, but an infected native coming down from the hills to the plains develops in the warm weather typical florid yaws. [These observations confirm those of SELLARDS.] Discussing later stages of the disease Dr. Ramsay states that in an experience of over 1,000 cases of yaws tertiary lesions, with exception of the lesions on the hands and feet above mentioned, are uncommon. Arthritis occurs in 3 per cent., chiefly of the phalanges. Six cases of periostitis were met with. Juxta-articular nodules were seen in two patients giving a history of yaws. Gangosa, goundou and cases of "neuroframboesia" were not seen.

Tertiary lesions appear to occur more frequently among the hill peoples than those on the plains and the author believes that this difference is accounted for by some effect which malaria has upon the disease among the plain dwellers. He believes that the mild cases of syphilis without tertiary lesions seen in the same district are similarly accounted for. This belief he bases on POWELL's observation that yaws eruptions often retrogress and disappear if the patient suffer some febrile disturbance, malarial or otherwise. Dr. Ramsay says, "it would seem a feasible conclusion that the prevalence and severity of tertiary framboesial lesions depends upon the absence, incidence and degree of malarial infection in a yaw-infected region." [That the eruptions of many skin diseases will disappear as the result of a febrile attack is well known, but is there any proof that under similar conditions a case of yaws is cured?] As the matter stands at present it is little more than an interesting speculation, but one upon which more extended observations by Dr. Ramsay and workers in other countries may throw further light.

H. S. Stannus.

BORY (Louis). **Le pian, affection parasyphilitique ou syphilis primitive.** —*Progrès Méd.* 1924. June 28. No. 26. pp. 393–395. With 2 text figs. [2 refs.]

The author, who is apparently a disciple of the school which believes that yaws and syphilis are one and the same disease, goes over the old ground of the multiple resemblances of the two diseases without bringing forth any new evidence in favour of this thesis. He believes that yaws is the more primitive type of disease, one that has remained dermotropic in its manifestations under its primitive conditions among native races in tropical countries, but that since the beginning of the era of colonization coincident with Columbus' voyages the disease spread among Europeans under different conditions and developed into syphilis as we know it, the virus in the earlier centuries being still dermotropic but later becoming more and more neurotropic. He looks upon yaws as primitive syphilis, and suggests that the term "parasyphilis" should include yaws of the present day and syphilitic affections caused by the neurotropic virus in cool countries. [This is a suggestion which would seem to have little to commend it and one which does not make for any simplification of the problem. One might with good reason say "why not call syphilis paraframboesia" ?]

The author tends to argue from similarities [everyone knows these points of similarity] rather to the exclusion of the specific differences between the two diseases. [The fact that mucous membranes are rarely if ever the seat of lesions in yaws is surely of greater importance than that the mucous plaques seen, say, between the nates in both syphilis and yaws are difficult or impossible to differentiate from one another, just as two skin diseases which have become eczematized may be difficult to differentiate.]

Dr. Bory denies any morphological differences between the two spirochaetes and sees in the results of cross-immunization experiments only evidence of there being perhaps as much difference between the races of yaws spirochaetes and syphilis spirochaetes as between the virus of neurotropic and dermotropic syphilis, beliefs that would not be held by many observers ; also many authorities deny the separate existence of neurotropic and dermotropic viruses in syphilis. The whole problem is an interesting one and calls for further investigation, but Dr. Bory has, the reviewer feels, done very little to help its elucidation.

H. S. S.

GUTIERREZ (Perpetuo D.). **The Importance of the Tertiary Manifestations of Yaws.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 568–577. With 9 figs. [27 refs.]

The study of 229 cases of yaws at Paranaque (Philippines) revealed tertiary lesions in a third of the patients. Cases with primary lesion 10 ; secondary 90 ; tertiary 24 ; secondary plus tertiary 39 ; primary, secondary and tertiary 14. The tertiary manifestations noted were periostitis in 7 cases ; gummata in 3 ; keratosis in 10 ; combined lesions in 3. The author then gives a fairly precise description of these tertiary clinical manifestations as observed by himself, but classes together as a single pathological entity keratosis palmaris et plantaris, peculiar pitting of the hands, foot yaws and melung, a point upon which many observers would not agree. He also wrongly ascribes the

description of melung to CASTELLANI and CHALMERS, whereas the term was first used by ZIEMANN for a condition, observed by him in West Africa and at about the same time by the reviewer in East Africa, believed to be a form of leucoderma. Later, the condition characterized by pigmentary changes affecting the skin of the hands, wrists, feet and ankles was believed to be due to yaws. The author considers that gangosa and juxta-articular nodules (cases not included in the series above) are also manifestations of yaws, but he brings forward no pathological evidence. The photographs are good, but represent ordinary typical cases, and there is nothing new in the subject matter of the paper. [See also this *Bulletin*, Vol. 20, p. 175.]

H. S. S.

ANDRUZZI (Alcibiade). **La framboesia tropica nella Somalia Italiana.**—*Ann. di Med. Nav. e Colon.* 1924. Nov.-Dec. Year 30. Vol. 2. No. 5–6. pp. 385–389.

Major Andruzzi, of the Italian Naval Medical Service, in the course of investigations regarding the incidence of plague in Italian Somaliland, came across a number of the inhabitants suffering from skin and bone lesions which he first attributed to syphilis. Later, he saw cases of undoubted yaws, and subsequently, among those who applied to the travelling ambulance for treatment for syphilis, was able from the clinical history and manifestations to pick out a number of cases of yaws in all its stages.

H. S. S.

CADY (Lee D.) & ENGMAN (Martin F.). **A Case of Yaws occurring in Missouri.**—*Arch. Dermat. & Syph.* 1924. Oct. Vol. 10. No. 4. pp. 446–452. With 4 figs. [4 refs.]

The authors here report a case which they believe to be yaws in a coloured man, aged 27, whose life had been spent in Tennessee and Missouri, the disease having been contracted, they suggest, from his mistress, or from hides with which he was in contact during his work for two years. [No evidence is adduced to inculpate the hides, and the only fact mentioned about the mistress is that her blood serum gave a complete positive Wassermann reaction.] The initial lesion consisted of small nodules in front of the ear like warts, which became covered with white scales, and later fungated and ulcerated: this was followed by a generalized eruption, and an ulcerated area 2·5 cm. in diameter appeared on the hard palate. The Wassermann reaction and the Kahn test were both triple plus. Preparations from 12 lesions were examined by dark ground illumination, but in only one were spirochaetes seen—two non-motile organisms whose characteristics are not mentioned. A large number of inoculations were made into rabbits and into one *Macacus rhesus* monkey with negative results, except that one rabbit developed a positive Wassermann reaction. Portion of a skin lesion was excised and the micropathological changes are described; no spirochaetes were seen in these sections. Treatment by neo-arsphenamin was followed by rapid disappearance of the lesions and the induction of a negative Wassermann reaction in four weeks. [The diagnosis appears to rest on the clinical and pathological findings, but in reading the account one is left with some hesitation in accepting it as a case of yaws.]

Reference is given to a review of the literature by FOX, who mentions 51 cases observed in the United States, but the majority are poorly reported and occurred in seaports and were therefore probably imported cases (see this *Bulletin*, Vol. 20, p. 178). He also refers to the Californian case under ALDERSON and COE, but this again was an imported case.

H. S. S.

BARKER (F. A.). **A Case of Framboesia in the Nicobar Islands.**—*Indian Med. Gaz.* 1925. Jan. Vol. 60. No. 1. p. 29. With 1 text fig.

Major Barker reports this typical case of yaws as probably the first to be recorded from the Nicobar Islands. The patient, a native of Nankauri, stated that "though there is no other case in his village, the disease is very common in certain villages of Nankauri and the neighbouring islands."

H. S. S.

ESLER (A. R.). **Laryngeal Obstruction in a Case of Yaws.**—*Kenya Med. Jl.* 1925. Feb. Vol. 1. No. 11. pp. 347–348.

Herein is reported the case of a native child, aged two years, suffering from secondary yaws, who was brought to the Fort Hall hospital on account of severe dyspnoea from laryngeal obstruction for which tracheotomy was performed. Two injections of a bismuth salt were given, and the dyspnoea disappeared. No cause for the dyspnoea was discovered, but in view of the effect of treatment by bismuth in this case, and of a similar history subsequently obtained in half-a-dozen other cases of yaws with the same symptom similarly treated, it is surmised that the symptom of laryngeal obstruction was in some way due to yaws.

H. S. S.

MCKENZIE (Alan). **A Case of Syphilitic Infection in a Patient suffering from Yaws.**—*Lancet.* 1924. Dec. 20. pp. 1280–1281.

A clinical record [no laboratory facilities were available] relating to a Polynesian male, aged 20, who, coming under treatment for a traumatic ulcer of the leg in March 1922, developed typical framboesial eruption on the face and chest in the first week in April. For this he received three injections of N.A.B. at weekly intervals ; a total of 1·1 gm. being given. The lesions had all disappeared before the last injection. He was not again seen until Feb. 20 1923, when he presented a typical mucous syphilide on the lip, a typical yaw at the right nostril, and another large yaw between the nates, together with a typical Hunterian chancre on the prepuce, with shotty inguinal glands and a recent history of sore throat. The chancre had appeared a fortnight after intercourse with a known prostitute. All signs cleared up under treatment with weekly injections of 0·9 gm. N.A.B. [total not mentioned]. Giemsa stained smears from the lesions were examined but spirochaetes were not seen.

The author is convinced that this is a case of syphilitic infection in a man already suffering from uncured yaws.

[The evidence thus adduced by a clinical observer familiar with both diseases is of considerable value, and it would be useful if all similar cases were put on record.]

H. S. S.

i. MATTLET (G.). **Traitement des lésions pianiques par les sels de bismuth.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 193–198.

ii. MIGUENS (J.). **Traitement du pian par le dermatol.**—*Ibid.* pp. 141–148. [1 ref.]

i. The author's conclusions regarding the results of treatment by bismuth salts of a large number of cases of yaws among the native population of Urundi may be summed up as follows :—(1) Bismuth salts are as useful in the treatment of yaws as of syphilis. (2) Their use in arsenic resistant cases has been most gratifying. (3) They may be used in cases which do not support arsenic well. (4) Ill effects are practically nil. (5) The method of administration is a simple one and may be placed in the hands of native assistants, a point of practical importance when dealing with a disease widespread among a scattered native population. (6) The cost is small compared to the arsenical preparations.

The drugs used were (*a*) Bischloral, containing 80 per cent. of the metal, by deep intramuscular injection into the buttock at weekly intervals, a total of 0·7 centigramme per kilo. weight being thus administered ; (*b*) Dermatol suspended in olive oil according to the formula of Dr. YERNAUX in the *Bruxelles-Médical* of April 26 1923 ; 3 grammes of bismuth subgallate are incorporated with 29 cc. sterilized olive oil, whereby the suspension contains 5·0 centigrammes of metallic bismuth. Three to seven doses each of 3 cc. were given for an adult ; (*c*) Mercury has no place in the treatment of yaws.

Many cases have been watched by the author for two years subsequent to treatment without recrudescence of signs of the disease.

ii. In the second paper the results of the treatment of 15 children by oily suspension of dermatol are given ; they were universally good. The dosage here recommended is 1 cc. for infants up to 2 or 3 years ; 2 cc. between 3 and 10 years ; 3 cc. from 10–20 years, and 4 cc. for adults ; the injections are given every 3 or 4 days until lesions have disappeared, a sixth dose being seldom required.

H. S. S.

PALMER (F. J.). **The Treatment of Yaws by Salts of Bismuth.**—*Proc. Assam Branch Brit. Med. Assoc. Ann. Meeting, Jorhaut, 16th & 17th February, 1924.* pp. 19–23.

The author having read of the successful results attending the use of Trepol in the treatment of syphilis made tentative experiment with bismuth salicylate (optimum dosage, 6 grains, in oily suspension, intramuscularly) in a small series of cases of yaws [60 injections only given] and reports favourably.

There is no new information in this paper. The numbers dealt with are very small and the results not detailed.

H. S. S.

GUERRERO (Luis E.), FERNANDEZ (Ricardo) & ROSAL (Irene). **On the Treatment of Yaws by Sodium-Potassium Tartaro-Bismuthate.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 578–582. With 12 figs. [8 refs.]

Three cases of Filippino children treated with this bismuth compound are reported ; 0·15 to 0·2 gm. doses intramuscularly every 4th or 5th

day were given. A number of radiographs of a case of framboesial dactylitis improving under treatment are figured.

The authors believe that "cure" was effected after 4 or 5 injections, but consider that bismuth is inferior to the arsenobenzols.

H. S. S.

PORTOIS. **L'action de l'airol dans le pian.**—*Bull. Méd. du Katanga.* 1924. Dec. Vol. 1. No. 6. p. 250.

Good results are reported in the treatment of 20 cases of yaws, secondary eruptions clearing after 3 or 4 injections. The author hazards the opinion that the rapid clinical cure is effected by the iodine ion rather than the bismuth in this preparation.

H. S. S.

BEURNIER (A.) & CLAPIER (P.). **Effets du stovarsol dans les lésions de gangosa et dans le pian.**—*Revista Méd de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a, 7a e 8a Sessões.) 1923. Aug. No. 4. pp. 349–366. With 1 plate. [1 ref.]

A communication embodying in detail the results of treatment by means of stovarsol or "190" (acetyl-amino-oxyphenyl-arsenate of soda) of 8 cases of gangosa and 11 cases of yaws, some in hospital at Libreville, others in their villages in the north-west province of French Congo. Of gangosa the authors state that every village has its two or three cases, and they incline to believe that the disease is syphilitic in origin rather than framboesial. The immediate results obtained in the two series of cases were universally good. It remains to be seen whether relapse occurs. The authors, having regard to the liability natives exhibit of developing toxic symptoms after the administration of drugs containing mercury, arsenic, etc., recommend a modification of the treatment advocated in the first place by FOURNEAU in the treatment of syphilis in Europe. They use a dose of 1 gm. for persons of over 50 kgm.; 0·5 gm. for those under 40 kgm.; 0·25 gm. for those between 15 and 30 kgm., administered in tablet form *per os* in the morning before food with or without sodium bicarbonate on alternate days of 15 to 17 days. If lesions have not all cleared up, treatment is recommended with rather smaller doses after the interval of a week. The only complication encountered was diarrhoea, which soon disappeared with temporary cessation of treatment.

H. S. S.

ROUVROY. **Action du stovarsol sur le pian.**—*Bull. Méd. du Katanga.* 1925. Feb. Vol. 2. No. 1. pp. 16–17.

A short report of the results obtained by treatment with stovarsol in five cases of yaws. In four cases, aged between 25 and 30 years, infection had been acquired in childhood, and complaint was made of late plantar lesions with, in a single case, lesions elsewhere on the body. The fifth case was that of an infant, aged 18 months, suffering from florid secondary yaws. Treatment of this child consisted of 0·25 gm. each day for a week, when in consequence of the onset of acute diarrhoea use of the drug was suspended and castor oil given. The diarrhoea soon cleared up, and on the 14th, 15th and 16th days the doses of

stovarsol were repeated, all lesions by this date having disappeared. The dosage in an adult case, followed by complete disappearance of lesions, was on the 1st and 2nd days 0·75 gm.; on the 3rd, 4th and 5th days 1 gm., followed by six days with 0·5 gm.

H. S. S.

THIEME (O.). **Meine Erfahrungen ueber 1137 Salvarsaninjektionen bei Framboesie in Samoa.** [Experiences of 1,137 Salvarsan Injections for Yaws in Samoa.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Apr. 1. Vol. 29. No. 4. pp. 162–171. With 3 text figs.

The author, who died in 1917, had spent 9 years in Samoa, and some of his observations on yaws are now published. They include notes upon the clinical side, and his method of treatment by salvarsan, with references to accidents during treatment. He states that in 9 years' practice, with observations on 9,831 native cases, he never saw a Hunterian chancre, and he believes syphilis to be rare. He mentions that there is a disease among horses in Samoa resembling yaws.

H. S. S.

PATERSON (A. R.). **Note on the Use of a Bismuth Salt in Substitution for Organic Arsenical Preparations in the Treatment of Yaws** (*Framboesia tropica*) **with Special Reference to the Financing of an Anti-Yaws Campaign.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 581–585. [United Fruit Company, Boston, Mass.]

This paper contains a recapitulation of facts in connexion with the yaws campaign in Kenya Colony which have already appeared elsewhere.

H. S. S.

i. HARPER (P.). **Yaws in Fiji.**—*Kenya Med. Jl.* 1925. Apr. Vol. 2. No. 1. pp. 18–20.

ii. SEQUEIRA (J. H.). **Some Problems of Syphilis.**—*Ibid.* pp. 12–16. (Discussion pp. 16–18.)

i. Dr. Harper, who is one of those who believe that yaws occurs among the Fijians to the exclusion of syphilis, refers to the fact that until recent years all children were inoculated with yaws and that 95 per cent. of the population was affected. The disease is still very common in Fijians over 2 years of age, but major manifestations are less often seen since the introduction of salvarsan in 1911. Hereditary yaws or syphilis is never seen; mothers treated for tertiary yaws in hospital have always borne children healthy at birth, and for some weeks later while under observation. [This would not disprove the possibility of the mother having been treated for an affection which was in reality syphilitic.] The author then goes on to say that there is evidence that yaws is a cause of miscarriage [!], that among the late manifestations of the disease are "sabre tibiae," gummatous ulceration of skin, nasal septum and palate, iridocyclitis, transverse myelitis and of the paraframboesial disease, aortic aneurysm and optic atrophy are commonest symptoms, while tabes and G.P.I. also occur [!]. Dr. Harper states that no case of primary syphilis has yet been reported in a Fijian, though they have access to the many Indian prostitutes, members of the Indian population, who number some 60,000, and among whom syphilis is rife. He believes that the Fijian, owing to

past yaws, is immune to syphilis. [This attitude appears, as POWELL has pointed out, to beg the whole question, and for most of those who have studied these two diseases there is obviously enough on the author's own showing to suggest that syphilis does occur among the Fijians. The fact that primary chancres have not been seen and reported goes for nothing, as has been proved in other native populations. On the other hand, there is every probability that the cases of aneurysm and of affections of the nervous system are certainly of syphilitic origin. Why does the author introduce the term "paraframboesial disease"? Tabes and G.P.I. are now known to be syphilitic parenchymatous neurosyphilis, and when the term parasyphilis is just being relegated to an era of uncertain pathogeny, why introduce its analogue, and why place aneurysm in such a category? Aneurysm due to syphilis was never included as a parasyphilitic manifestation.]

ii. A paper read before the Kenya Branch of the B.M.A. by Dr. Sequeira when on a visit to East Africa, in which he formulates a number of questions relating to syphilis and yaws which require answers, with subsequent discussion. Nothing new emanated from any of the contributions made, but the uncertainty with which practically everyone spoke serves to show very well the necessity for further careful study and record of cases before many of the problems of these two diseases can be elucidated.

H. S. S.

BENIGNO VELASCO (C.). **Contribución al estudio clínico del pián.**—*Repert. de Med. y Cirug.* 1921. Sept. Vol. 12. No. 12. (No. 144.) pp. 647–675.

ERNST (John R.). **A Case of Yaws.**—*Proc. Med. Assoc. Isthmian Canal Zone.* 1920. Jan.-Dec. Vol. 13. Pts. 1 & 2. p. 98. With 1 plate.

GISLEN. **Le pian (Framboesia tropica).**—*Arch. Méd. Belges.* 1923. June. Vol. 76. No. 6. pp. 464–472. With 2 figs.

PORTOIS, TILSLEY & MAIRLOT. **Traitement du pian par le tartro-bismuthate de soude et de potasse.**—*Bull. Méd. du Katanga.* 1924. Oct. Vol. 1. No. 5. pp. 190–193.

SYPHILIS IN NATIVES OF WARM COUNTRIES.

GILKS (J. L.). **A Medical Safari in a Native Reserve.**—*Kenya Med. Jl.* 1924. Dec. Vol. 1. No. 9. pp. 270–274.

In this article the Principal Medical Officer, Kenya Colony, describes a short visit paid to a dispensary at Assembo, in the Central Kavirondo native reserve, where a treatment centre for yaws and syphilis has been established; treatment being by intramuscular injections of bismuth. "The greater number of the cases of yaws were children" with typical framboesial eruptions, with "only a small proportion showing anything like generalized tertiary lesions." "The cases of syphilis had genital lesions almost without exception; men with primary chancres and women with ulceration, sometimes very extensive, of the pudenda. In one case only was anything like a well-marked secondary rash observed." The author believes that the Kenya native does not suffer so severely when infected with syphilis as the European and speculates whether some partial immunity exists in the native as the result of previous yaws. A large proportion of those *applying* for the specific treatment complained only of "aches and pains"—an observation which is interesting in view of the fact that bone pain was the symptom of syphilis which brought many natives to the venereal clinic at Dakar, as noted by NOGUE. Another large group of those seeking treatment were women, who asserted that they had suffered from syphilis in the past with many abortions in consequence, and that after one or two injections of N.A.B. or bismuth they had given birth to healthy children; that they were now again pregnant and asked for a single injection to ensure the birth of a normal child. Dr. Gilks records these "unsolicited testimonials" to the efficacy of antivenereal treatment with reserve. Such an attitude on the part of the native is typical, and the story told to ensure receiving an injection of "the medicine" is a valuable sidelight on native psychology when it comes to collecting data for statistics. Mention is made that no cases of congenital syphilis were seen, but, on the other hand, "a number of quite small boys and girls applied for treatment for what were clinically primary and secondary lesions of the genitalia." From the context it is not quite clear whether one is meant to understand that in these cases the disease was contracted by sexual contact, a point which is of importance in view of the fact that in other parts of Africa child infection is common enough, but gained by other than sexual contact.

Up to the present time Dr. Gilks points out that there has been no time available for investigation of cases and keeping of records. [The necessity for such investigation and records is imperative before the big problems of yaws and syphilis among native races can be properly understood and tackled, and it is to be hoped that he will before long have funds and staff at his disposal to undertake this work. Comparison of the observations given in this article with those made in other parts of Africa will show many interesting points of divergence worthy of study.]

H. S. Stannus.

i. PATERSON (A. R.). **Venereal Disease Work in Kenya.**—*Kenya Med. Jl.* 1925. Mar. Vol. 1. No. 12. pp. 366–372.

ii. STONES (R. Y.). **Notes on the more Prevalent Diseases in Central Kavirondo.**—*Ibid.* pp. 359–362.

i. A paper read by the Chief Sanitation Officer of Kenya Colony before the Imperial Social Hygienic Congress at the British Empire Exhibition, Wembley, May, 1924. The incidence of "venereal disease" among the natives of Kenya is discussed and the opinion expressed that while it is common in the coast towns and not uncommon in the up-country town, among the rural populations of the Native Reserves the incidence is small. The only figures given, however, refer to 8,000 Kavirondo natives examined two years ago who showed only 1 per cent. with evidence of syphilitic infection. The rest of the paper is given up to a consideration of the lines along which anti-venereal propaganda and treatment may best be directed.

ii. Dr. Stones refers to his "observations made in this hospital [unnamed, but presumably the Church Missionary Society Hospital in the Kavirondo Province of Kenya Colony] during my short period in this country." They refer chiefly to syphilis. He finds constitutional symptoms of the second stage seldom marked with the exception of the "severe encephalitis which occurs and brings the patient for treatment." [Do they really suffer from a severe *encephalitis* or does the author refer to headache ?] Some speculations are then offered as to the cause of "the mildness of the constitutional symptoms." Criticizing a statement by Dr. GILKS (P.M.O., Kenya) that he had never seen a case of congenital syphilis, the author says that such cases are not uncommon. "Of 36 infants with the congenital disease, 22 showed secondary sores in the napkin area ; 9 had the syphilitic wig ; 5 had well-marked snuffles ; 4 epiphysitis ; 3 enlarged livers ; 1 had at three months dactylitis of the fingers." He then wisely refers to the difficulty of distinguishing some of these lesions from yaws and adds that "Hutchinson's teeth, affections of the cranium and interstitial keratitis seem to be rare." Primary sores are not uncommon in men, but seldom seen in women. "Other signs, such as falling hair, sore throat, and rash with fever and anaemia, are rare. Acute synovitis is occasionally met with, but the chronic going on to a Charcot's joint unless arrested is more common, and seems to be associated with the tertiary stage. Tertiary manifestations such as gummata and gummatous nodes on the bones and ulcers are common, as are chronic synovitis and Charcot's joints. Neuro-syphilis is conspicuous by its rarity." [This passage is quoted at length as one really fails to understand what Dr. Stones means. If neurosyphilis be rare, how does he account for Charcot's joints being common, lesions which are secondary to neurosyphilis and only neurosyphilis ?]

H. S. S.

FREW & others. **General Discussion on Venereal Diseases.**—*Proc. Transvaal Mine Med. Officers' Assoc.* 1924. Dec. Vol. 4. No. 8. pp. 2–7.

This verbatim report of a discussion which took place in December, 1924, contains little information of clinical interest. On the other hand, various speakers emphasized the lack of systematized and co-

ordinated treatment of cases of syphilis occurring among the natives employed on the Rand Mines. The aim and principles of treatment appeared to rest on no sound basis. To anyone reading the report it would certainly appear that the subject requires further investigation. Incidentally, what appears to be a lack of any organized Government campaign against venereal disease among natives in South Africa was mentioned. Venereal diseases, like tuberculosis, should interest the administration of native areas whence " boys " are drawn for work in the Mines, and this report will be read by them with a desire for further information.

H. S. S.

McNAUGHTON (J. G.). **Bismuth Sodium Potassium Tartrate in the Treatment of Epilepsy.** [Memoranda.]—*Brit. Med. Jl.* 1924. Nov. 15. p. 899.

Epilepsy and epileptic insanity have long been known to be common among the native inhabitants of the East African colonies. Dr. McNaughton, of the Tanganyika Territory Medical Service, finding a pachymeningitis in one of these cases " examined post-mortem " came to the conclusion that they were syphilitic in origin and commenced to treat others with injections of the above-mentioned bismuth salt. Short notes of four cases of epileptic insanity so treated are given and also a case of epilepsy with urinary incontinence.

He considers that " in the majority of insane natives in this Territory, the insanity is related to syphilis," and says, " as a routine treatment now all patients receive injections of the bismuth salt. In cases where no improvement results I take it that the disease is not syphilitic in origin."

These cases are briefly given below :—

1. Male insane epileptic. After a serious fit was given 3 gr. doses bismuth salt weekly for 6 weeks : " No fit occurred for 9 months, and he appeared normal." He then had three fits and treatment again commenced : " No further recurrence of fits."

2. Male insane epileptic. Understood to have " been sick in his village for some years " : very obstreporous and noisy, necessitating forcible restraint : 10 injections given ending December, 1923 : " since January he has been quiet and amenable . . . " and " is quite rational."

3. An epileptic maniac who had had fits for three years and had committed homicide : treated by injections from October, 1923, till January, 1924 : " the fits, which had been of almost daily occurrence, *ceased after one week*, and he became quite rational " : some months after ceasing treatment he had a fit, and treatment was restarted.

4. Female, aged 30, admitted with acute mania : " On August 12th she was disturbing the white and native staff to such an extent that she was given a 3 gr. injection of the bismuth salt. The result was marvellous : *she slept on that night*, and has been quiet and fairly rational ever since."

5. Girl, aged 6 years. " Epilepsy complicated with incontinence of urine each night " : weekly injections of 1 gr. bismuth salt given between October and Deember, 1923. " *After the first injection the fits, which had been of almost daily occurrence, ceased, so did the nocturnal incontinence* " : she was discharged the following March apparently cured : in June fits recurred, and 10 more injections were given : " so far there have been no further fits."

[Practically no previous history is given in these cases ; no mention is made of history or signs of infection with syphilis, no Wassermann reactions were apparently done and no cerebrospinal fluids examined. The presumption of syphilis as the cause rests therefore upon the finding

of pachymeningitis in a few cases, and on the results of treatment. Attention should, however, be drawn to the statements made in the notes of the last three cases which have been italicized ; they may be the clue to the explanation of the results of treatment. It is hardly possible to believe that the subsidence of symptoms following *immediately* on a single injection were due to the effects of the drug upon some causative syphilitic lesion in the central nervous system ; it seems more likely that the condition which was so successfully treated was the superimposed hysterical manifestations. Many fits in epileptics are of this nature ; in some cases it has been shown that the majority of the fits are hysterical though indistinguishable from the true epileptic fit. One must remember, too, in dealing with the East African native that he is a very suggestible person. Many cases of epilepsy in East Africa may be syphilitic in origin, but one feels that the case is as yet not proven. The problem is very interesting, and one of importance, as many homicides in these countries are committed by this type of lunatic. May we look forward to a complete investigation of the subject by Dr. McNaughton ?]

H. S. S.

HALL (Giles A. M.). **Extragenital Chancre.** [Memoranda.]—*Brit. Med. Jl.* 1924. Nov. 15. p. 899. With 1 text fig.

Records the case of a chancre situated on the lower and inner part of the bulbar conjunctiva in a Chinese woman aged 23 years. The presence of *Treponema pallidum* was proved, but the serum was negative to a modified Sachs-Georgi precipitation test. The source of the infection was untraced. Syphilis is stated to be rife in Tatungfu, Sha, a large garrison town just outside the Great Wall of China, and a very large number of cases of extragenital chancres is seen—lip, tongue, tonsil, mamma, abdominal wall and rectum.

H. S. S.

NEUBERGER (J. K. W.). **Luetische Pseudotumoren. (1) Tumor ventriculi, (2) tumor musculorum abdominis, (3) tumor orbitalis.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 5. pp. 746–755. [23 refs.]

In the three cases quoted the symptoms suggested surgical affections. Only in case 3 was the tentative diagnosis syphilis made and specific treatment administered before operation.

The wide spread of unrecognized or insufficiently treated syphilis in the tropics, as well as the diverse manifestations which it may produce, should make the surgeon in the tropics cautious in every tumour case, and give specific treatment a trial when syphilis is even vaguely suspected.

W. J. Bais.

LEVADITI (C.), NICOLAU (S.), SALGUE (J.) & SCHOEN (R.). **Mécanisme d'action du bismuth dans la syphilis.**—*C. R. Acad. Sci.* 1924. Nov. 3. Vol. 179. No. 18. pp. 939–942. [4 refs.]

A study of the mechanism of absorption of bismuth administered by intramuscular injection and its mode of action upon spirochaetes at the seat of a primary syphilitic lesion. Five rabbits with primary chancre on the scrotum and seven controls were injected with trépol,

0·1 gm. per kilogramme weight, the former being killed after 1, 2, 3, 4 and 6 days, the controls at the end of 7, 8, 11, 13, 15, 20 and 25 days. The chancres were examined histologically and chemically and microchemically, the muscle at the site of injection by the first two methods. The results showed that :—

(1) The amount of bismuth absorbed is minimal, even after a considerable lapse of time ; (2) the destruction of the spirochaete in the lesion is effected by the presence of such minute quantities of bismuth as defy determination by chemical methods ; (3) the spirochaetes retain a normal appearance for 24 hours after the treatment, but from the second day they show granular degeneration ; (4) the bismuth salt is dissociated under the influence of a leucocytic exudation, and the metal set free ; this unites with proteid substances derived from the broken down leucocytes and is absorbed by mesoblastic cells and vascular endothelium, and thus in infinitesimal amounts is carried to the specific lesion where spirochaetolysis is effected ; (5) the muscle injected at first undergoes coagulation necrosis, with myophagy, followed by regeneration commencing on the third day.

H. S. S.

TANGANYIKA TERRITORY. ANNUAL MEDICAL REPORT FOR THE YEAR ENDING DECEMBER 31ST, 1923. pp. 171–177.—**Third Report upon Treatment with Bismutho Sodium and Potassium Tartrate.** [DAVEY (J. B.), ILES (M.), MCNAUGHTON (J. G.) & MOOLE (Y.).]

The results obtained in the treatment of syphilis and yaws by bismuth preparations have been encouraging, the average dose of the salt being 2 grains intramuscularly every fifth to seventh day. A large proportion of cases appear to have developed stomatitis as the result of treatment, and a number of deaths are reported, facts which emphasize the necessity when dealing with natives, especially the debilitated or those suffering from intercurrent infections, of proceeding with great caution.

So far these diseases are being treated by medical officers at the Government hospitals situated in the various more important townships. "Some hundreds" of cases only are reported. Probably, if treatment could be carried to the native in his own home far removed from centres of civilization yaws would be found to be very prevalent, and the numbers seeking treatment would run into tens of thousands.

H. S. S.

CLARK (H. C.). **A Survey at Tela Hospital to determine Syphilis.**—*United Fruit Company. Medical Department. Twelfth Annual Report.* 1923. pp. 147–162. [11 refs.]

The greatest industry on the North Honduras coast is fruit growing. A relatively small force of white Americans and English controls and directs the labour of a much larger number of young adults drawn from all parts of Spanish Honduras, and to a less extent from the West Indies (Negroes). This survey was not intended to show how many patients were treated primarily for their syphilitic infection, but rather to learn the prevalence of the disease in the community and then analyse any facts elicited in the histories of the patients. Dr. Clark used a modification of the Noguchi complement fixation test, such as had been found reliable at the Board of Health Laboratory, Panama Canal. He notes the increasing volume of opinion, founded on

critical experience, that, apart from exact clinical search, a reliable "Wassermann-Bordet" test, in skilled hands, is of undoubted value in determining the incidence of syphilis in a community; for, according to CRAIG (whose experience in this respect is almost unrivalled)—"The cases of syphilitic infections that are apparently without clinical symptoms far outnumber those that present typical symptoms."

Dr. Clark gives details of his Wassermann technique, tabulates results, and analyses them under categories of age, sex, residence, employment, in or out patient, diseases, casualties and race. The criticism is thorough.

Yaws is rare in the district and could not materially affect the Wassermann results. Actually, 1,234 males and 200 females were tested—about half the total number of patients treated at Tela Hospital from November 14th, 1922, to end of September, 1923. One table only may be here given:—

Races.	Number.	Positive. (++)	Doubtful. (+)	Combined Per cent. (probable Syphilis).
Negroes and mulattoes...	200	52 (26%)	18 (9%)	35%
Latin-Americans ...	1,113	147 (13.2%)	75 (6·7%)	19·9%
North Americans and Europeans	104	10 (9·6%)	13 (12·5%)	22·1%
Syrians	14	2 (14·2%)	2 (14·2%)	28·4%
Chinese	3	—	—	—

Dr. Clark points out that most of his negroes came from the West Indies and former yaws in their case cannot be confidently excluded. But VEDDER's report on enlisted coloured soldiers U.S. Army shows 36 per cent. probable syphilitics. The Panama Canal 1916 report gave 30 per cent. probable syphilis in negroes. The Panama Canal rate for probable syphilis in whites is 16 per cent. for both civil and military forces: compare with this Peter Bent Brigham Hospital rate 15 per cent. probable syphilis of all patients admitted, while the Bellevue Hospital gives a rate of 25 per cent. The Panama Canal rate for Latin-Americans was 26 per cent.

The reviewer may, perhaps, be allowed to comment here that a (?)finer sensibility has so far prevented any survey, worth quoting, of probable syphilitics in the hospital patients of England, but all physicians must now be aware of the fact that it would be found to be somewhere about 15 per cent. It is now known that a negative Wassermann does not exclude finally the possibility of syphilis, in any stage, in any patient, and can carry no weight against informed clinical findings and history of case: on the other hand, "positives," of varying degrees of doubtfulness, are often found in cases who are not syphilitic.

Malaria is well known to give occasionally a "positive" Wassermann in non-syphilitics—especially if the blood be taken during a paroxysm. In the reviewer's experience true malaria positives have always been weak or doubtful positives (Medical Research Council: Wassermann test No. 1) and have not persisted. A definite positive++has persisted and has meant syphilis (yaws being excluded), as confirmed later by results of anti-syphilitic treatment, if not by clinical signs or

history. Dr. Clark's analysis of his Wassermann results in relation to malaria is of interest, and value, to physicians in tropical practice. He argues with force, that if malaria, or any other disease, is to influence the result of the test it should in a large number of cases of the disease reveal a higher rate of positive tests than the normal incidence of positives obtained in a general survey; and any marked increase in the disease at different periods of the year should be accompanied by a rise in false results in the application of the test. His comparison of the net results of the tests in the cases of malaria, helminthiasis, and external violence shows that the rate has not been materially changed. Moreover, the tables showing the monthly admissions for malaria and alongside the monthly incidence of positive Wassermann tests do not reveal any parallel increase with malaria, of the positive Wassermanns. 315 malaria fever cases showed 10·7 per cent. positive (++ and +) Wassermann results. During the same period 84 subjects of external violence admitted to hospital gave 10·7 positive Wassermann results.

There is no evidence in Dr. Clark's careful analyses of results that malaria offers any significant interference with the test, though he found in a few cases of malaria a transient positive + result.

H. M. Hanschell.

WALRAVENS. **Prophylaxie des maladies vénériennes.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a, 4a e 5a Sessões.) 1923. Aug. No. 4. pp. 155–165.

Dr. Walravens, Director of the Laboratories at Elizabethville, relates the facts which led to the Belgian Government making a decree dealing with the compulsory notification and treatment of venereal diseases in the Belgian Congo, and quotes the rules made under a local ordinance giving effect to this decree. The regulations, which apply to both European and native, follow very much upon the lines laid down by the 1919 law in Sweden, and include under the term venereal diseases, syphilis, gonorrhoea and chancroid; treatment to be continued until "cure" is effected as certified by the medical man.

The writer points out the conditions under which it may be possible to administer this decree as affecting syphilis, but mentions the difficulties with regard to gonorrhoea.

[It will be interesting to see what degree of success follows this method of compulsion in a native colony. All such laws bring difficulties in their train, and it is questionable whether any law is good law which must remain a dead letter in certain of its applications. No standard of cure is mentioned nor are methods of treatment dealt with.]

H. S. S.

NEVES (J. da Silva). **A lucta antivenérea nas Colónias.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a, 4a e 5a. Sessões.) 1923. Aug. No. 4. pp. 167–177.

In this paper Dr. Neves, Director of the Urological Department of the Central Hospital, Loanda, discusses the question of antivenereal

work chiefly in relation to prostitution. The familiar arguments for and against regularizing prostitution, notification, compulsory treatment, personal prophylaxis, etc., are traversed. The necessity for providing treatment for syphilis is, of course, recognized, but in regard to gonorrhoea he quotes JANET, who believes that it is better not to attempt to cure gonorrhoea in prostitutes, as they will immediately become reinfected; rather allow the infection to lose its virulence and wear itself out. The paper contains no information as to the prevalence of the diseases in Angola nor upon actual treatments used.

H. S. S.

PIJPER (Adrianus). **Two and a Half Years' Work at an Anti-Venereal Clinic for Natives and Coloured Persons.**—*S. African Med. Rec.* 1924. Aug. 23. Vol. 22. No. 16. pp. 369-372. [5 refs.]

The total number of persons treated for venereal disease in this 2½ years at the Pretoria Clinic was 2,150, of whom only 21, or 1 per cent., were cases of gonorrhoea. This low figure, it is pointed out, is probably due to the fact that the native neglects gonorrhoea as a trivial complaint and does not seek treatment.

The incidence of syphilis as gauged by the Wassermann reaction among the general native population attending the General O.P. Dept. of the hospital was 57 per cent., or among the total native population of Pretoria of 23,000 there are 8,500 suffering from syphilis.

The clinical manifestations of the disease are dealt with very briefly. "Rheumatism and neuritis" were commonly complained of; skin eruptions, condylomata and gummatous ulcerations with caries of the nasal bones were commonly observed [but no statistics are given]; mention is also made that "eye complaint and headaches, lung affections resembling phthisis and all kinds of kidney and stomach troubles are represented; cases of "syphilitic asthma" and "syphilitic diabetes" were also seen. [The diagnosis in all these cases rests apparently upon the fact that symptoms and signs cleared up under anti-syphilitic treatment.]

The M.O.H., Pretoria, is quoted as reporting that there is no natural increase of the coloured (native) population; 1,200 adult married patients suffering from syphilis had produced 4,725 children, of which 2,064 had died, and this loss of child life and lack of increase of population is ascribed to syphilis, without any further reasons being given. [There is no information about miscarriage rate forthcoming, and no mention is made of heredo-syphilis.]

Syphilis insontium is believed to be common [it undoubtedly accounts for a considerable proportion of cases among native races]. Treatment was by means of neosalvarsan or substitutes given intravenously, with mercury and potassium iodide by mouth. The usual difficulties in getting patients to attend regularly and for full courses of treatment were encountered. 74 attended for Wassermann reaction only; 523 for one injection; 373 for two; 209 for three; 170 for four; 229 for five, and 549 for six or more injections.

H. S. S.

ALLAIN. **La lutte anti-vénérienne à Madagascar pendant l'année 1923.**—*Ann. de Méd. et de Pharm. Colon.* 1924. May-June-July-Aug. Vol. 22. No. 2. pp. 211–215.

The following table from this communication gives at a glance the scope of the campaign being undertaken in Madagascar :—

	1921.	1922.	1923.
Number of dispensaries	7	27	49
Number of consultations	24,714	69,227	146,697
CONDITIONS TREATED.			
Primary syphilis	63	387	785
Secondary syphilis	1,126	4,342	10,976
Tertiary syphilis	4,613	22,644	33,683
Hereditary syphilis	592	3,281	6,133
	6,394	30,654	51,577
Gonorrhoea	760	1,716	4,519
Simple chancre...	64	148	751
Skin affections and Yaws	1,119	1,815	9,337
METHODS OF TREATMENT.			
Arsenical injections	4,100	11,476	31,409
Mercury biniodide injections ...	10,519	31,854	40,298
Mercury cyanide injections	1,110	816	4,307
Gray oil injections	174	2,096	4,188
Mercurial frictions	836	180	226
Iodide treatments	7,383	3,362	27,669

There is little else to note. In 1923 over 30,000 intravenous injections of arsenical preparations were given without serious accident. No case of neuro-syphilis was met with.

H. S. S.

NOGUE (M.). **La syphilis chez les noirs au Sénégal. La lutte contre la syphilis à Dakar.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a, 4a e 5a Sessões.) 1923. Aug. No. 4. pp. 179–199. With 7 plates. [45 refs.]

The subject matter of this communication is practically the same as that contained in a paper by the same author, with the same title, published in *Ann. d' Hygiene Publique, Industrielle et Sociale,* and reviewed in this *Bulletin,* Vol. 21, pp. 799–800. Nothing need be said, therefore, except again to draw attention to the admirable clinical records of syphilis among African natives therein given.

H. S. S.

WRIGHT (L. T.). [**Ainhum : Report of a Case occurring in a Man with Syphilis.**]—*Urol.& Cut. Rev.* 1924. Mar. [Summarized in *Brit. Jl. Derm. & Syph.* 1924. Oct. Vol. 36. No. 432 (No. 10). p. 443.]

The author thinks that the relationship between syphilis and ainhum is worthy of further consideration. He considers that the complete diagnosis can be made by the type of bone absorption as shown by X ray examination.

H. S. S.

LEPROSY.

MITCHELL (J. Alexander). **Leprosy Administration.** [Government Circular.]—*S. African Med. Rec.* 1924. Nov. 22. Vol. 22. No. 22. pp. 529–531.

The South African Union Health Department has issued a statement of its policy with regard to leprosy administration. This includes a "Leprosy Survey" to determine the extent of the problem, no effective inquiry having been made since 1911, when 1,300 free cases were estimated in Transkei alone; an educative and publicity campaign, for removing prejudices due to erroneous beliefs that the disease is hereditary and highly infective through the air even to a distance, instead of being only slightly infectious after prolonged close contact; the appointment of a Leprosy Advisory Committee to include the prosecution of research work; the full use of the latest treatments; encouragement of voluntary isolation in the earliest stage; the discovery and segregation of all active infective cases; the appointment of a Leprosy Board, of both official and non-official medical men, to report periodically on all segregated lepers and to recommend the discharge of recovered and uninfective cases, 597 such cases having been already released subject to periodic clinical and bacteriological examinations; to authorize home segregation in suitable cases; gradually to convert Leper Institutions into "Leper Sanatoria" providing the best treatment for early voluntary cases, as with tuberculosis; and to secure the active co-operation of everyone concerned in combating the disease: all very excellent measures suitable for adoption elsewhere in leprosy-infected portions of our Empire, and based on the latest medical knowledge. Dr. J. A. Mitchell, Secretary for Public Health, is to be congratulated.

L. Rogers.

SOUTH AFRICAN MEDICAL RECORD. 1925. Feb. 14. Vol. 23. No. 3. pp. 51–52. **Leprosy Advisory Committee.**

This is a report of a meeting of the Leprosy Advisory Committee in December, 1924, at which the policy of the Department of Public Health dealt with in the preceding abstract was endorsed. The Government was asked to reduce, as far as possible, the heavy cost of institutional segregation, to spend some of the money saved on research, and to improve the treatment in the leper institutions, the excessive cost of the Robben Island colony being pointed out.

L. R.

ROBINEAU (Marcel). **La prophylaxie et le traitement de la lèpre chez les races primitives de l'Afrique Équatoriale.**—*Presse Méd.* 1925. Feb. 21. Vol. 33. No. 15. pp. 243–245. With 3 text figs. [3 refs.]

Dr. Robineau, an experienced French Colonial medical officer, deals with the difficult problem of prophylaxis against the widespread leprosy in tropical Africa, 52,000 lepers being estimated in a portion only of French Equatorial Africa. Any attempt at the collection and segregation of the lepers by force is rightly condemned as futile, the best plan being to send fairly early treated lepers in pairs through the villages to persuade other infected persons to come voluntarily

to the leper village to obtain the benefit of the improved treatments, and this plan has been found to yield good results. All new cases are confirmed bacteriologically before admission, for which purpose puncture of any enlarged glands and staining for acid fast bacilli is recommended in doubtful cases. All segregation must be voluntary, and no force ever used in collecting the patients, who must be attracted by the provision of free lodging and food, and land to cultivate towards their own support around the unenclosed leper villages, constructed according to the native plans, so that they feel at home. A hospital for helpless crippled cases, meeting-houses, schools and crèches for infants should be provided and religious freedom ensured. They should be classed in accordance with the clinical stages of the disease, with a special quarter for the infirm, and not according to social distinctions. Healthy infants of lepers should be nursed by healthy women, as artificial feeding is rarely practicable in the tropics, or goats' milk may be used, but negro women often object to giving up their infants unless they are placed in a neighbouring crèche, where their mothers can visit them once a week. Good hygiene and the best treatment should be provided, since leprosy is no longer to be regarded as incurable under persevering treatment. This is fully appreciated by the blacks and attracts them to the isolation villages, but a great field remains open for further research to perfect the methods of curing leprosy.

L. R.

ROBINEAU (M.). **La lutte antilépreuse dans une circonscription du Cameroun.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a, 4a e 5a Sessões.) 1923. Aug. No. 4. pp. 385–392.

This paper deals with similar material to one in the Transactions of the Strasbourg Leprosy Conference already dealt with in this *Bulletin.* It emphasizes the difficulty in segregating lepers in tropical Africa and the necessity of attracting them to come for treatment. Intramuscular injection of chaulmoogra esters is the best method, although very prolonged treatment and infinite patience is required to obtain good results.

L. R.

CORREIA (Germano). **A lepra em Angola.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a, 4a, e 5a Sessões.) 1923. Aug. No. 4. pp. 369–374. With 1 chart.

A brief paper showing that Angola is not an important centre of leprosy. Records are tabulated which demonstrate that there have been 30 deaths from this disease since 1873, of which 27 occurred in Loanda, 2 in Mossamedes and 1 in Benguela. No estimations of the actual number of cases is attempted.

H. Harold Scott.

GENEVRAY (J.). **La lèpre en Nouvelle-Calédonie.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14 & Feb. 11. Vol. 18. Nos. 1 & 2. pp. 78–89. pp. 158–177. With 6 figs. & 3 maps in text.

This paper gives a long account of leprosy in the French Australasian colony of New Caledonia, with a full history of the well-known outbreak there. It brings out the fact that the disease is now decreasing considerably, and accounts for it mainly by the originally almost solely nodular infectious type of cases having become altered to show a considerable proportion of the relatively little infective nerve type, especially in the islands first infected. Many of the European convicts became infected, but they have for some time been isolated, and their numbers have fallen from the highest point of 211 to 158 in 1924; the death of 1,113 lepers of all nationalities in the last 10 years has played an important part in their reduction. The attempts to isolate the lepers, first in numerous leper villages, then in one central island colony, which had to be abandoned on account of its cost, and again in villages without much supervision are narrated, and the comparative failure of the attempts yet made to deal with the disease is pointed out. The laws are excellent, but lack of funds prevents their being enforced, and the writer advocates the appointment of a special medical officer to inspect all the leper villages and to carry out the laws regarding the discovery and isolation of the infected. He is of the opinion that if this done, and with proper financial support, it will prove successful in reducing the disease far more rapidly than hitherto.

L. R.

DOUGLAS (A. R. J.). **A Visit to Culion Leper Colony, Philippine Islands.**—*Lancet.* 1925. Jan. 17 & 24. pp. 143–145. With 1 text fig; 201–204. With 1 text fig. [11 refs.]

This is a general account, with no claim to originality, of the well-known Culion Leper Colony, based on a visit paid to it last year. It covers familiar ground dealt with in papers by the Culion medical staff in papers recently reviewed in this *Bulletin*, and includes an illustration of a group of 225 "negative" lepers awaiting the completion of six months "negative period" before their release. This furnishes graphic evidence of the full use which is being made in this, the largest leper colony in the world, of the recent advances in our knowledge made by the splendid American and Filippino staff there.

L. R.

WOOD (Leonard); OLDRIEVE (Frank); DOUGLAS (A. R. J.); MCKEAN (James); BARTLETT (C. L.). **Leprosy Work at Culion.** [Correspondence.]—*Boston Med. & Surg. Jl.* 1925. Mar. 19. Vol. 192. No. 12. pp. 571–576.

The correspondence consists of letters forwarded for publication by General Leonard Wood, Governor of the Philippines, including reports made to him by visitors to the Culion Leper Settlement. The most important point is made by Mr. Oldrieve, when he urges the immediate necessity of providing homes for the untainted children of the lepers so as to put a stop to the numerous infections which have taken place among them ever since the colony was opened.

L. R.

PANAMA CANAL. **Report of the Health Department of the Panama Canal for the Calendar Year 1923.** [FISHER (H. C.).]—**Palo Seco Leper Colony.** [TUCKER (Frederick D.) & HORWITZ (Philip).] pp. 45–52. With 1 plate.

In January, 1923, 70 remained in this Colony, 14 were admitted during the year, 4 died, 6 were paroled, and 74 remained at the end of the year. Average duration of the disease at death was 10 years and of stay 5 years. Of the paroled cases the average duration was 6 years for males and 4 for females, and the stay 4½ years; 38 were West Indians, 35 Panamanians, 4 Colombians, 2 Chinese, 1 Haitian, and 1 Ecuadorian. Chaulmoogra esters were injected regularly and definitely arrested the progress of the disease in early and in fairly advanced stages, but progress often becomes slow after a time.

L. R.

PUPO (Aguiar). **A prophylaxia da lepra em S. Paulo. Defesa do "Leprosario de Santo Angelo." Moção ao Sr. Presidente do Estado.**—*Ann. Paulist. Med. e Cirurg.* 1924. Nov. Year 12. Vol. 15. No. 11. pp. 261–270. [1 ref.]

Leprosy was originally introduced into Brazil by Portuguese colonists, and during the last 30 years its spread has been great. In S. Paulo in 1916, when the first reliable estimations were made by RIBAS, there were 1,171 cases; in 1920, RIBEIRO found 4,115 cases, and estimated the total as not less than 4,500, or one per mille. At a Medical Congress in December, 1915, suggestions were made for compulsory notification, for isolation of poorer patients in leper colonies, and domiciliary treatment of others, for the care of families of indigent lepers, prompt separation of the children of leprous parents, prevention of immigration of lepers, notification of change of residence of those afflicted, disinfection of their houses, and so forth.

The second part of the paper deals with objections raised against the Santo Angelo leprosarium, mainly on account of its being situated near the capital and on the bank of the River Jundiahy, a tributary of the Tieté. These objections are stated to have no sound foundation.

H. Harold Scott.

ABEN-ATHAR (Jayme J.). **Considerações sobre a endemiologia e a prophylaxia da lepra.**—*Sciencia Medica.* 1924. Dec. 31. Vol. 2. No. 12. pp. 697–702.

By figures and returns from some of the chief districts of Brazil the author shows that leprosy is in the indigenous largely a disease of childhood and early adult life, so that, as in yellow fever and tuberculosis, repeated inoculations in early years set up a degree of immunity which protects adults of maturer years. Examination of the returns of patients infected later in life shows that the majority are immigrants. The question of prophylaxis is barely mentioned.

H. H. S.

PAZ SOLDAN (Carlos Enrique) & MONGE (Carlos). **La lepra en el Perú. Communicación presentada a la Academia de Medicina.**—*Cronica Méd.* 1924. Nov. Vol. 41. No. 737. pp. 344–350. [6 refs.]

A propos the case of a woman, 25 years of age, suffering from leprosy and coming from Huallanca in the Department of Huánco, the authors present a table taken from official records showing that in the hospitals of Lima during the nine years 1913–1921, inclusive, there have been 31 persons admitted for leprosy, of whom 5 have died. From investigations which they have made they conclude that leprosy is rare in Peru, the chief foci of the disease being the banks of the River Ucayali. Although the population there is small and scattered, the danger of spread must not be overlooked. The case recorded came from a district hitherto believed to be free from leprosy, and another noted by FRASER in Talara points to the possibility of a focus on the neighbouring frontier of Ecuador. Medical men are asked to help in determining the actual number of lepers in Peru.

H. H. S.

FORDYCE (John A.) & WISE (Fred). **Leprosy in New York City.**—*Arch. Dermat. & Syph.* 1925. Jan. Vol. 11. No. 1. pp. 1–48. With 40 text figs. [11 refs.]

This account of the occurrence of leprosy in New York is illustrated by an excellent series of photos of cases in various stages, mostly fairly early ones, and contains a table of 47 cases, aged from 7 to 55, 37 of whom were males; 29 were whites, 11 mulattoes, 6 Chinese and 1 a negro, but only three had been born in the United States, most of them having come from South America and the West Indies. The difficulty in recognizing the earliest stages, which are often concealed, is emphasized; the very varying incubation period, the frequent positive Wassermann reactions, and the contagiousness are discussed, the latter being definite but slight, and microscopical sections of skin and liver nodules are illustrated. The paper is a valuable one for those who only occasionally meet with the disease.

L. R.

MACLEOD (J. M. H.). **Contact Cases of Leprosy in the British Isles.**—*Brit. Med. Jl.* 1925. Jan. 17. pp. 107–108.

The writer reports three interesting cases: (1) A boy, aged 12, who had never been out of Ireland, developed nodular leprosy contracted from his father, a poor Russian who had emigrated there with advanced nodular leprosy; (2) a boy, aged 15, with nodular leprosy, who was born and had always lived in Lancashire, but whose elder brother returned from British Guiana with nodular leprosy in company with his uninfected parents. The younger child, born in England soon after his parents' return, had been in close association with his leprous brother "with whom he had slept for five years, and from whom he contracted the disease." Both boys died of leprosy; (3) a Belgian woman married in England a man suffering from nodular leprosy, with whom she lived without any precautions, and contracted the disease from him. [It is very suggestive that two, at least, of the patients slept in the same bed with a nodular leper for

some years before contracting the disease, as in the case of the former well known Dublin infection : an easily avoidable and quite unnecessary exposure.]

L. R.

SEYFARTH (C.). **Ein Besuch in der Leproserie "Spina longa" bei Kreta (Griechenland).** [A Visit to the "Spina Longa" Leprosery off Crete.]—*Deut. Med. Woch.* 1925. Apr. 17 & 24. Vol. 51. Nos. 16 & 17. pp. 665–666. With 10 text figs. & pp. 705–706. [5 refs.]

The author gives an interesting account of the leper colony established in 1904 at Spina Longa, an old ruined island-fortress off the coast of the larger island of the same name in the Bay of Mirabella, north-east Crete. It has now become the leper colony for the whole of Greece.

The lepers occupy themselves in housework, gardening, and the preparation of their food. Among the 210 are rather more men than women, mostly between the ages of 35 and 50. The youngest is a lad of 16, the youngest woman is 25. There are also a few older patients up to 70 or 75 years of age. The number always remains about 200-250. The average number of deaths each year is 30 and the number of fresh arrivals about the same. All the inhabitants of the island are lepers with the exception of four elderly wives who accompanied their leprous husbands voluntarily to the leper colony. None of them show any signs of leprosy. One case of infection, however, has occurred in one of the boatmen who bring over the raw foodstuffs daily from Plaka. After 8 years of such intercourse he developed leprous rhinitis at the age of 35, followed by nodular leprosy. Marriages between the lepers are not rare. The author was shown a 4 weeks old infant born of leprous parents. Since 1904, 12 others have been born on Spina Longa and survived. All are said to be quite healthy, and 9 of them have been transferred to an orphanage at Athens after living with their parents on Spina Longa from birth to various ages from 6 months to 10 years. Two others have been adopted by relatives.

All stages and forms of the disease were seen. The following are the proportions :—

Nodular leprosy...	about 30	patients.
Nerve leprosy	,, 70	,,
Mixed forms	,, 100	,,

The author draws attention to the almost unrivalled wealth of material on Spina Longa for the study of leprosy, and concludes with some proposals for the improvement of the colony, which he considers is very appropriately situated. When the island has been transformed into a worthy sanatorium for lepers it will be possible to carry out a systematic scheme for the control of leprosy in Greece and Crete. At the present time, unfortunately, the Greek Government is not in a position to make the necessary improvements.

L. R.

TORNABUONI (Giuseppe). **La Lepra nella Toscana Marittima.**—*Riforma Med.* 1925. Feb. 9. Vol. 41. No. 6. pp. 140–141.

Believing that the number of lepers was greater than the published records would indicate, the author made enquiries and investigations in Pisa, Liverna, Lucca, and in part of Spezia, and discovered 32 cases

(26 men and 6 women), of which only two had contracted the disease locally. Fourteen were of the nodular type, eight anaesthetic, and ten mixed. A great majority, 22 out of the 32, were found in the Province of Lucca. The local medical men, he states, do not understand the importance of adequate treatment. Statistics of the Minister of the Interior give 186 as the total number of lepers resident in Italy in September, 1923, but later figures bring the total to 230.

H. Harold Scott.

CEDERCREUTZ (Axel). **Spetälskans förekomst i Finland.** [The Occurrence of Leprosy in Finland.]—*Finska Läkaresällskapets Handlingar.* 1925. Feb. Vol. 67. pp. 143–153. With 2 maps & 3 curves.

In 1924 there were 57 known cases of leprosy in Finland—29 men and 28 women—corresponding to one leper in about 60,000 inhabitants. From 52 cases in 1893 the total rose to 67 in 1897 and 95 in 1904, but has now decreased considerably. Six of the men and eight of the women who were married had altogether 76 children, and amongst this progeny, some of whom had, of course, died, only one case of leprosy occurred, in a man now 48, who had had leprosy for five years. The majority of the cases occur in South West Finland. There has been a gradual rise in the age of the patients since 1897; in 1924 the mean age was 56·8 years; 70·2 per cent. of the lepers are now over 50 years of age. During the last 20 years the number of cases of nodular leprosy has considerably diminished in proportion to those of the anaesthetic variety. This also is a sign that the disease is steadily decreasing in Finland, as the nodular form is considered to be much the more contagious. One of the most important reasons why leprosy is on the decline in Finland is that a well-managed leper asylum was opened in Orivesi in 1904. Regarding infectivity, it is stated that four cases of leprosy occurred successively in the manageresses of a small hotel in the Åland Islands, and it is suggested that infection may be transferred from one generation to another through the furniture, with which in such cases women principally come in contact, and which has not been properly disinfected. Some control of the lepers living out of an asylum is advocated, and the appointment of an inspector, such as has existed in Norway with great benefit for several years, is suggested. It would be advisable to set aside a sum of money, beyond the cost of the Orivesi Asylum, to help the lepers, the majority of whom have only small means, and to make life in the asylum attractive to them so that fewer would be at large and a danger to the community. In this way Finland would in 20 years be as good as free from leprosy and would get rid of the slur of being numbered amongst the European countries in which autochthonous cases of leprosy occur.

E. E. Atkin.

MUIR (E.). **The Predisposing Causes of Leprosy.**—*Lancet.* 1925. Jan. 24. pp. 169–171. With 1 text fig. [6 refs.]

"There is probably no disease in which predisposing causes play a more important part than in leprosy." This dictum is illustrated by striking examples of temporary or permanent predisposing causes, the former including attacks of febrile diseases, such as enteric, influenza,

or small-pox, the extra strain of pregnancy, the climacteric of puberty, or unfavourable diet, climate or surroundings; while among the latter are narrated syphilis, chronic bowel affections, protozoal fevers, including malaria and kala azar, or hookworm disease. One or more predisposing causes are commonly found in leprosy, and if present and removable the prognosis is improved greatly. On the other hand, in the more advanced stages of leprosy the onset of a specific fever may result in resolution and even disappearance of the leprosy lesions. Every one of ten advanced lepers developing kala azar improved rapidly as far as the leprosy was concerned, nodules and skin infiltration rapidly disappearing, and less marked improvement was noticed after dengue, malaria, cholera, dysentery and even pregnancy. Leprosy in the earlier increasing stages may be rendered worse by such reaction-producing diseases, but if they occur during the descending curve after leprosy has reached its height and the infection begun to decline, such complications may produce a beneficial effect, and in this stage treatment and exercise may be pushed with good results, most deformities being due to lack of vigorous treatment in the later stages of the disease.

L. R.

Wood (D. J.). **Ocular Leprosy.**—*Brit. Jl. Ophthalm.* 1925. Jan. Vol. 9. No. 1. pp. 1–4. With 2 figs. in colour.

The writer has studied the eye lesions in lepers at Cape Town, which he finds to consist of progressive irido-cyclitis of an insidious nature, quite different from ordinary forms of iritis, and going on to occlusion of the pupil and opacity of the cornea, lens and vitreous, with shrinking of the eyeball. It begins with very small yellow lepromatous points on the iris, which becomes so rotten and brittle that iridectomy fails; but glaucoma never results. The lesions are best studied with the slit-lamp and the binocular microscope. The condition is illustrated by a small coloured plate showing small white rounded nodules raised above the surface. The cornea shows large numbers of white spots at variable depths. In a recent case the writer has injected subconjunctivally 1 per cent. sodium taurocholate added to 1 in 2,500 bicyanide of mercury in 2 per cent. saline with definite improvement, such as he has never seen before.

L. R.

Newsholme (Arthur). **A Note on the Causes of the Historical Reduction of Leprosy.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 791–795. [2 refs.] [United Fruit Company, Boston, Mass.]

In this short paper the well-known statistics of the reduction of leprosy in Norway by means of segregation of only a portion of the infected are quoted to show that complete isolation of all cases is not necessary in such a slightly infectious disease to bring about a great diminution of leprosy, and the lesson is applied to tuberculosis, the domiciliary and institutional treatment of which, especially the latter, may be expected to reduce the disease materially even if incomplete. The importance of the improved treatment of leprosy in leading to a more rapid diminution of the disease in the tropics is also emphasized.

L. R.

ROGERS (Leonard). **The Prophylaxis and Treatment of Leprosy, with Special Reference to Tropical Africa.**—*Kenya Med. Jl.* 1925. Feb. Vol. 1. No. 11. pp. 322–330. [3 refs.]

This paper deals with the subject on similar lines to other communications by the same writer. It lays stress on the importance of not attempting to enforce segregation in backward tropical areas, lest more harm should result from concealment of the early amenable cases, which it is most important to attract to the hospitals and dispensaries for treatment, than good from the isolation of a small proportion of the advanced cases, in which stage most of the nerve forms are not infective.

A. G. B.

DELAMARE. **Infantilisme lépreux.**—*Rev. française d'Endocrinologie.* 1923. July. No. 3. [Reprinted in *Etudes & Notes* (*1923*). *Chaire de Médecine exotique de la Faculté de Constantinople.* pp. 24–32. [3 refs.]

The writer describes two cases of leprosy in which the frequently recorded infantile characters persisted. The first was a young man of 17 years, whose sexual powers were still undeveloped, with advanced nodular leprosy, including a nodule in one testicle. He presented other signs of ill-development, but none of the characters due to defective thyroid. Thyroid gland treatment had no effect on him; his mind, though somewhat childish, was not otherwise deficient. The other was a mixed case of leprosy in a boy of 14, who was ill-developed for his age, with very little pubic or axillary hair and testicles the size of cherries, but not showing any leprous nodules.

L. R.

EYCKMANS (Robert). **Léprose pulmonaire pure dans un cas de lèpre tuberculeuse.**—*Bruxelles-Méd.* 1925. Mar. 29. Vol. 5. No. 22. pp. 733–736.

The occurrence of true leprous lung lesions has long been disputed, and requires animal inoculations for its proof even post mortem; the author does not know of any case in which it was proved during life. [E. MUIR has reported one.] He relates a case in which numerous acid-fast bacilli were found in the sputum of a female leper aged 54, who contracted the disease while sister in charge of leper children, in whose room she slept, the disease developing into well-marked nodular leprosy. After six years' progress she developed signs of febrile bronchopneumonia, the sputum showing very numerous acid-fast bacilli and granules resembling those of leprosy, with which two guineapigs were inoculated; one died after 18 days with a local abscess containing no bacilli, but some cocci; the other had a small local abscess, but recovered, and on being killed three months later was healthy. The patient recovered from the lung complication and her skin lesions also improved for a time.

L. R.

HUDELO & KOURILSKY (R.). **Un cas de lèpre mutilante autochtone.**—*Bull. Soc. Française de Dermat. et Syph.* 1925. Mar., No. 3. pp. 102–106. (Discussion pp. 106–107.)

This case of advanced nerve leprosy with loss of digits was found at Cotignac (Var), in mid France, in a boy aged 13, whose elder sister aged 17 was also a nerve case of leprosy, both cases apparently having been infected in France in a manner not traced. Professor JEANSELME in the discussion suggested that a somewhat similar case may have been infected through the husband, who had lived in leprous countries although not apparently a leper himself; he was possibly a carrier.

L. R.

DELAMARE & DJÉMIL (Said). **Le calcanéum des lépreux.** [Société Anatomique 1923. June 30.]—*Etudes & Notes (1923). Chaire de Médicine exotique de la Faculté de Constantinople.* pp. 63–64.

Radiographic examination of eight lepers showed in several of them abnormalities in the os calcis, firstly, in the common form of patches of partial decalcification throwing lighter shadows, and secondly, as hypertrophy of the bone accompanied by partial decalcification.

L. R.

RODRIGUEZ (Jose). **Progress of Leprosy Treatment Work at Culion Leper Colony.**—*Jl. Philippine Islands Med. Assoc.* 1925. Feb. Vol. 5. No. 2. pp. 40–46.

This is the fourth six-monthly report on the treatment of advanced cases of leprosy at Culion up to March 31, 1924. Of 2,810 patients then under treatment 9·7 per cent. had become negative bacteriologically, 62 per cent. had improved, 15·6 per cent. were stationary, and 12·6 per cent. were worse, the 273 negatives not including 40 paroled or discharged during the past six months. From May 1921 to October 1924, 405 patients had become negative at Culion, doubtful cases being excluded, and about 300 more were considered to be negative by the treating physicians, but were being kept under further observation before discharge; remarkable results undreamed of in such advanced cases a decade ago. Table 1 summarizes the results of the last four reports and reveals progressively improved results.

TABLE 1.—GROSS RESULTS, ALL PROGRESS REPORTS.

Date of Progress Report.	Cases.	Improved.	Stationary.	Worse.
		Per cent.	Per cent.	Per cent.
September, 1922 ...	4,067	56·0	36·0	8·1
March, 1923	4,035	53·3	36·0	10·7
September, 1923 ...	3,252	63·6	23·9	12·5
March, 1924	2,810	71·7	15·6	12·6

The results of the different methods of administering the chaulmoogra oil derivatives are given in Table 2.

TABLE 2.—TOTAL IMPROVEMENT BY DRUGS.

Drugs.	Total treated	Improved.				Stationary.	Worse.
		Neg.	Mkd. & Mod.	Slight.	Total.		
Chaulmoogra ethyl esters, plain (C.E.)	161	14·3	26·1	21·6	62·0	21·1	16·8
Chaulmoogra ethyl esters with ½ per cent. iodine (C.E.I.) ...	158	9·1	44·7	23·7	77·3	11·9	10·8
Chaulmoogra ethyl esters with 10 per cent. creosote (C.E. Cr.)	423	12·0	41·6	19·6	73·2	13·9	12·7
Chaulmoogra ethyl esters with ½ per cent. iodine and 10 per cent. creosote (C.E. I.Cr.)	935	9·8	35·3	29·2	74·3	16·6	9·1
Mercado mixture ...	533	6·4	29·5	24·4	60·3	19·3	20·4
Total	2,810	9·7	37·0	25·0	71·7	15·6	12·6

The iodized ethyl esters continue to be best with 77·3 per cent. improved; the creosoted preparations are almost as good, and both are considerably better than the plain esters, which are much more irritating, or the Mercado chaulmoogra oil mixture intramuscularly, although the last is least irritating, and so preferable in cases complicated with nephritis. The plain esters are much more irritating than after the addition of iodine or creosote and have now been given up. The higher alcohol esters of chaulmoogra oil have been found to be less efficacious than the ethyl ones, and cod liver oil esters were too irritating. The dosages of the iodized esters advised is 2 to 5 cc. once a week intramuscularly, and creosoted esters or the Mercado mixture should be injected twice a week to get the best results.

Table 3 gives the results in cases of different duration; those under 5 or over 25 years show most improvement, the latter manifesting strong natural resistance.

TABLE 3.—DURATION OF DISEASE TO IMPROVEMENT.

Duration.	Cases.	Improved.	Stationary.	Worse or dead.
Years.		Per cent.	Per cent.	Per cent.
0 to 5 ...	1,156	75·6	12·6	11·8
5 to 10 ...	1,066	66·9	17·3	15·7
10 to 15 ...	453	67·1	18·5	14·3
15 to 20 ...	130	67·6	20·0	12·3
20 to 25 ...	47	76·6	14·9	8·5

Table 4 shows that the effects of treatment improved with its duration, up to 32 months, and then remained about stationary, the lower figure between 18 and 24 months being due to a large number of unfavourable cases included in the early period of the treatment.

TABLE 4.—TOTAL TIME TREATED TO IMPROVEMENT.

Total time treated.		Improved.	Stationary.	Worse.
Months.	Cases.	Per cent.	Per cent.	Per cent.
To 6 ...	24	29·2	58·3	12·5
6 to 21 ...	92	50·0	23·9	26·1
12 to 18 ...	314	70·6	17·5	11·8
18 to 24*a* ...	1,344	61·3	21·2	17·4
24 to 32 ...	749	85·4	8·3	6·3
32 to 35 ...	302	84·3	6·0	9·6

a This large group includes many unfavourable cases placed under treatment at the beginning of the present campaign.

Lepra reactions in the form of fever or the appearance of new crops of skin lesions are regarded as evidence of depressed bodily resistance, which are to be avoided as far as possible, for of 3,249 patients studied from this point of view 644, or about 25 per cent., had one or more lepra reactions, and only 30 per cent. improved, 42 per cent. were stationary, and 31 per cent. became worse, against 2,605 without such reactions, with 45 per cent. improved, 42 per cent. stationary, and only 13 per cent. worse. Complaints of various kinds were made by 43 per cent. of the patients, cough, pain in the chest and fever being usually an indication of tubercular complication, which occurred in 158, or 45 per cent. of the 350 cases who dropped out of the treatment clinics, other causes being nephritis in 61, or 18 per cent., protracted lepra reactions in 54, or 15 per cent., leprotic involvement of the eyes in 18, or 5 per cent., and other complications in 59, or 17 per cent.

L. R.

WADE (H. W.), LARA (C. B.) & NICOLAS (C.). **Complaints of Patients under Antileprosy Treatment. I. Nature and Frequency in Cases receiving Chaulmoogra Ethyl Ester Preparations.**—*Philippine Jl. Sci.* 1924. Dec. Vol. 25. No. 6. pp. 661–691. [1 ref.]

——. **II. Comparison of Plain Chaulmoogra Ethyl Esters and Two Iodized Preparations.**—*Ibid.* pp. 693–710. [1 ref.]

——. **III. Comparison of Creosoted and Non-Creosoted Chaulmoogra Ethyl Ester Preparations.**—*Ibid.* 1925. Jan. Vol. 26. No. 1. pp. 21–45. [7 refs.]

i. An analysis has been made of the complaints made by over two thousand patients under treatment at Culion. These influence the dosage, etc., especially in the advanced cases met with in segregation colonies, so are of great practical importance. They numbered from 63 to 79 per cent. in the two main clinics, and fall into five groups: (1) Includes immediate symptoms, namely, coughing and choking, in 4·9 per cent., and dizziness in 1·5 per cent., causing only temporary and not very important disturbances; (2) local effects in the form of inflammation in 21·3 per cent., nearly always in the form of induration, only nine abscesses having occurred, most of which were sterile; (3) includes general symptoms, such as headache, malaise and simple fever recorded in 6·0, 6·4 and 9·3 per cent. respectively;

(4) chest pain and oppression and cough were noted in 15·0 and 19·1 per cent. respectively and are important complaints: haemoptysis was very rare, in spite of phthisis being a common complication of leprosy; (5) comprised reaction symptoms, either lepra fever or cutaneous eruptions without fever, met with in 14·3 per cent., and even inflammation in another 2·8 per cent., while rheumatic pains were noted in 1·8 per cent. A 6th group is formed by symptoms of nephritis, but as these were not systematically sought their percentage cannot be given; albumen was often found in the urine. Complaints were equally frequent in the two sexes, and were commonest in the highest age group of over 60 years; they were fewer with the larger doses owing to the amounts being reduced in those complaining. The writers are doubtful whether it is advisable to produce leprous reactions or not, but are inclined to consider it unnecessary and perhaps harmful to do so.

ii. This paper contains a careful analysis of 2,818 cases of leprosy to determine the best way of giving the ethyl chaulmoograte as a routine method of treatment, either by itself or with 2 per cent. or 0·5 per cent. of iodine in addition. The results show that the plain ester is more irritating to the tissues at the site of injection and also to the respiratory tract than iodized esters, thus seriously limiting the intensiveness of the dosage, and that they also caused more general symptoms. Of the two strengths of iodine the latter has distinct advantages, allowing of the use of larger doses, while it has no disadvantages as compared with the plain esters; the addition of 0·5 per cent. iodine is therefore the method of choice. The writer notes that in Honolulu 4 per cent, iodine was originally used, but has now been reduced to 1 per cent.; this is closely in accordance with their independent conclusion, which may therefore be safely accepted.

iii. This paper presents a further careful analysis of the complaints in 2,214 cases under different treatments by plain ethyl chaulmoograte, and with the addition of 0·5 per cent. iodine, 10 per cent. creosote, or both respectively, the cases having an average duration of 8·3 years. It was found that the addition of creosote had a very similar effect to iodine in reducing the local irritation and enabling the dosage to be pushed to more effective amounts. The difference between the two is not material, but, if anything, is in favour of iodine; lung symptoms were more frequent with the creosote; the choice therefore depended on therapeutic results not yet determined. The addition of both drugs gave rather less favourable results, and is not recommended, and it may be advisable to reduce the amount of the creosote; MUIR now uses only 4 per cent.

L. R.

GAVINO (Catalino) & TIETZE (Samuel). **Results obtained from the Various Treatments of Leprosy at San Lazaro Hospital, 1920-1924.**—*Jl. Philippine Islands Med. Assoc.* 1925. Feb. Vol. 5. No. 2. pp. 50–61.

During the past four years the various newer treatments have been carried out in the lepers admitted to this hospital under difficulties due to frequent transfers to Culion, but with a larger proportion of early cases than in that colony. No negative cases were obtained in the first six months to the end of 1920, but during 1921, of 46 cases treated by ROGERS' methods (sodium gynocardate and sodium

morrhuate) 9 had become negative, and of 366 on Dean's plain chaulmoogra esters 9 were negative, as well as 3 of 15 on Mercado's mixture. In 1922 iodized esters were used with the practical abolition of local abscesses, 20 negative cases resulting out of 444 patients, and 8 negatives of 34 treated by ROGERS' preparations; in 1924 iodized esters were nearly exclusively used with 72 negatives out of 503 treated. The main causes of 95 deaths in five years were lung disease, chiefly tuberculosis in 28, and kidney involvement in 13. From 1922 to 1924 82 patients were given certificates of parole, and 33 permanently joined the community as useful citizens, or 11 negative cases. They conclude :—

"When one is acquainted with the results of antileprotic treatments of fifteen or twenty years ago and compares them with the present number of negatives, such favourable progress is almost unbelievable. To us, who had seen a negative case for the first time ten years ago, it seemed miraculous that patients could be rescued from a hopeless disease—could be taken from a 'living death' and allowed to enjoy the pleasures of this world."

L. R.

KEPPLER (A.). **Ueber Versuche mit subcutanen Chaulmoograöl-(aus** *Taraktogenos Kurzii*) **Injektionen.** [Experiments with Subcutaneous Injections of Chaulmoogra Oil (from *Taraktogenos kurzii*).]—*Klin. Woch.* 1925. Apr. 30. Vol. 4. No. 18. p. 879.

The experiments were made on dogs. For dilution various oils were chosen, partly with and partly without the addition of ether. While with other oils in the proportion 1 : 1 a clear solution could be obtained only by the addition of ether, arachis oil and chaulmoogra oil in the same proportion gave, without ether, a solution which at room temperature remained perfectly clear without any deposit after standing for several weeks on end. Omission of the ether renders the injections apparently quite painless to the animals. Injections of the dose quoted by HARPER for human beings, viz., 0·295 cc., administered at intervals of a week in various parts of the body had no effect whatever. The dogs retained their appetite and good digestion, and the urine remained free of albumin. Later, HARPER's double dose was given every third day at the same site (gluteal region). This, likewise, was without effect. With the idea of obtaining sterility of the oil, further experiments were made with the addition of 3 per cent. phenol to the mixture of arachis and chaulmoogra oils. These injections were likewise borne without any signs of pain or traces of albumin in the urine. After a few days, however, small superficially necrosing parts formed at the site of the injection which were then smoothly shed. In view of this symptom and the always present danger of phenol poisoning with a long continued treatment, it seems advisable to omit the phenol.

L. R.

KITS VAN HEIJNINGEN (A.). **Thymol-inspuitingen bij Lepra.** [Thymol Injections in Leprosy.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 6. pp. 932–933.

The author administered during 7 months injections of thymol in alcohol (twice per week, 2 cc. of a 10-40 per cent. solution), or thymol in anise oil (once only 4-8 cc. of a 60 per cent. solution). He did not see

any clinical or bacteriological result from this treatment, but admits that the patients' subjective feelings have improved. He was not satisfied with it.

W. J. Bais.

HEINEMANN (H.). **Over behandeling der lepra met thymol.** [On the Thymol Treatment of Leprosy.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 1. pp. 66–69. [2 refs.]

Heinemann used a preparation (Heyden 651a), containing 1 per cent. thymol in emulsion, for intravenous injections, every other day, beginning with 0·2 cc., 0·4 cc., 0·6 cc., and afterwards 0·8 cc., in which dose the medication is continued for a considerable time. The injections cause no pain. In 9 of a series of 12 patients treated there was a more or less noticeable improvement, but no real healing was established and in some cases relapses occurred.

W. J. Bais.

DELAMARE (G.). **Sur l'histoire de l'éparsénothérapie antilépreuse.**—*Progrès Méd.* 1925. Apr. 11. No. 15. pp. 535–538. With 1 chart in text. [14 refs.]

The writer summarizes the literature of this subject from the first roseate reports of the cure of leprosy in a few weeks of HASSON, of Alexandria, and of GOUGEROT (which were dealt with at the time in this *Bulletin*), and the favourable report of ROBINEAU at the Strasbourg conference, followed by unfavourable reports of MARCHOUX, JEANSELME and Delamare himself; and he shows by a chart that no successes have been reported since July, 1923, the earlier results being temporary improvement so often seen within a short time of using a new remedy, owing to insufficient allowance for the natural variations in the course of leprosy and especially marked improvement after a fresh exacerbation.

L. R.

DE SEQUEIRA (Luiz Artur Fontoura). **O antimónio no tratamento da lepra.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a, 4a e 5a Sessões.) 1923. Aug. No. 4. pp. 375–383.

The author gives an account of the results he has obtained with the use of antimony in leprosy. He employs "Oscol Stibium" for intramuscular and, occasionally, intravenous administration, and tartar emetic in 2 per cent. solution for the latter only. He states that antimony tends to accumulate in the skin and mucous membranes and thereby prevents the elimination of bacilli from the ulcerated surfaces. He gives brief details of 12 patients to whom injections were given on alternate days, starting with 0·04 gm. in 2 cc., and increasing by 1 cc. per diem till 0·1 gm. was given. This dose was not exceeded and the course consisted of 12 injections. After an interval of a few days a second and even a third series was given. Though considerable improvement resulted the author does not claim that antimony in any of its present forms will effect a cure, but he looks forward to the time when chemists will evolve a more efficacious preparation and one better tolerated by the patient.

H. Harold Scott.

LEVY (D. M.). **Unna's behandelingswijze der lepra.** [Unna's Treatment of Lepra.]—*Nederl. Tijdschr. v. Geneesk.* 1925. Mar. 28. 69th Year. 1st Half. No. 13. pp. 1422–1426.

The treatment is combined internal and external. The first consists of a chaulmoogra cure, the hydrolysed oil being taken in pills, containing 0·15 or (mitigated cure for very susceptible persons) 0·10 grams of the oil per pill—30 pills daily in 3 doses of 10 after each meal; it also includes a daily subcutaneous injection of "Durotan" (*i.e.*, a product of the esters of chaulmoogra oil, prepared by Beyersdorff, in Hamburg) in the morning, and an enema of 5 cc. oil in 50 grams of milk in the evening. For external treatment an ointment of yellow vaseline containing 5 per cent. pyrogallol, 5 per cent. ichthyol, and 2 per cent. salicylic acid is rubbed into the skin. This ointment acts as an irritant both to kidneys and skin and should therefore be applied with great care. Probably another ointment, Terpistrol, containing turpentine and said to have a specific action against the lepra bacilli, will prove, with further experience, to be more useful. (Some details are added as to local treatment of nodules of the skin, maculae and corneae, and cosmetic treatment of facial lesions.) The treatment is continued for two years in the hospital. The patients discharged are said to excrete no bacilli, to show no suspicious lesions of the mucosa, and to be in an excellent state of health. The internal treatment is continued at home for several years. Some patients show high fever and other reactions during this treatment. They undergo an unmixed ichthyol-cure (baths, pills, plasters).

N. H. Swellengrebel.

MONTERO (Aniceto). **La** *Bixa Orellana* **(Achiote) en el Tratamiento de la Lepra.**—*Rev. Méd. de Yucatan.* 1925. Feb. Vol. 13. No. 5. pp. 118–121. With 2 text figs.

The author has used preparations of Achiote, the common name for *Bixa orellana*, a plant closely allied to Chaulmoogra, for the treatment of leprosy. It is, however, somewhat poor in fats, various specimens yielding from 2·5 to 6 per cent. The dose used is not stated, but the author remarks that phagocytosis is stimulated at once, the bacteria disappear, and the clinical results are excellent; repeated examinations of the blood subsequently through a period of some years has failed to reveal bacteria and the disease has not recurred.

H. Harold Scott.

JACONO (I.). **L'albuminoreazione del muco nasale e l'autovaccino per la diagnosi precoce e la cura della lepra.**—*Riforma Med.* 1925. Feb. 2. Vol. 41. No. 5. p. 105.

This contribution consists of two distinct parts. In the first it is stated that although Hansen's bacillus cannot be found in some cases of leprosy in the nasal secretion albumen may be demonstrated. The author states that this sign is positive in 98 per cent. of nodular cases and in 86 per cent. of the anaesthetic. This does not quite harmonize with the succeeding sentence, in which it is said that if albumen is not present "leprosy can with certainty be excluded."

The second part is an adaptation to leprosy of the method previously recorded of treating lupus by a vaccine prepared from tuberculous glands. The author, having occasion to treat a patient of 70 years

suffering from generalized leprosy, which had proved resistant to other forms of treatment, excised a nodule from the arm under as aseptic conditions as possible, cut it into fragments, and triturated it in a mortar with normal saline, heated it to 60° C. for half-an-hour, and diluted it with phenol. 1 cc. of the final emulsion contained, roughly, 200 million lepra bacilli, though accurate enumeration was not possible owing to the clumping of the organism. The initial dose was 0·1 cc., and this was increased according to the clinical state. After three injections at intervals of a week there was notable improvement both subjectively and objectively. The size of the doses after the first is not mentioned.

H. Harold Scott.

TEDESCO (P. Atzeni) & MAZZOLENIS (U.). **Prime ricerche di capillariscopia nella Lepra.**—*Giorn. di Clin. Med.* 1925. Apr. 10. Vol. 6. No. 5. pp. 175–182. With 6 coloured figs on 1 plate.

The authors describe the conditions of the capillary vessels and loops and the changes which take place in them in the skin of leprous patients, as seen by means of a special form of microscope, called a capillariscope, devised by MÜLLER of Tübingen. A plate of six coloured figures is given which demonstrates the various appearances as seen by them. The plate is more descriptive than the text.

H. Harold Scott.

FAJARDO (Joaquin). **El bacilo de Hansen se encuentra en las deposiciones de los leprosos.**—*Repert. Med. y Cirug.* Bogotá. 1924. Dec. Vol. 16. No. 3. (No. 183.) pp. 117–124.

The author examined the faeces of a considerable number of lepers and suspected lepers for Hansen's bacillus in direct smears and after the use of antiformin and of alcohol and ether. He found them in the typical " bundle of cigars " arrangement in 100 per cent. of severe nodular forms, in 80 per cent. of those with few nodules, in 25 per cent. of the nervous cases, and in the macular period in 4 out of 10 patients examined. He gives in detail three cases in which examination of the nasal secretion was negative. In two the bacilli were readily found in the faeces. The third showed very slight indications, and would have been certified as healthy. Faecal examination revealed a few isolated bacilli in the first smear, and it was not until nine had been stained and examined that the typical " packets " were discovered.

H. Harold Scott.

STEVENSON (W. D. H.). **Complement Deviation and Globulin Content in the Blood of the Lepers. Part I. The Wassermann Reaction given by Lepers' Sera.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 583–600. [1 ref.]

Some unpublished work done in Bombay in 1910–11 is recorded, the Hecht modification of the Wassermann test as used by FLEMING having been adopted, although its disadvantages are recognized; 10, 5 and 2½ per cent. antigen in normal saline was employed. 27 of

37 with the 10 per cent. solution gave completely positive results, 18 of 35 with 5 per cent., and 7 of 33 with 2½ per cent. strength, nodular reacting better than anaesthetic cases, as others have found. The globulin content of lepers' sera was also tested by NOGUCHI's method in lepers denying a syphilitic history, and the general average globulin content of lepers' bloods was found to be very high; much more so than with syphilitics.

L. R.

PINEDA (Eloy V.). [In English & Spanish.] **Differentiation of Micobacterium Leprae from the more common Acid-Fast Bacilli. Deferenciacion del micobacterium leprae de los bacilus acido resistentes mas comunes.**—*Jl. Philippine Islands Med. Assoc.* 1924. Oct. Vol. 4. No. 10. In English pp. 373–379. [4 refs.] In Spanish pp. 396–398.

In the Philippines segregation is only legal in leprosy cases proved positive by bacteriological examinations, which are thus of great importance. The writer recommends incising the lesions to a depth of two millimetres, after cleansing the skin with alcohol or gasoline, the latter for preference, and then scraping the side of the wound, and fixing and staining the slide for three minutes in cold carbol-fuchsin and counterstaining with Gabbet's blue. [In Calcutta small pieces of skin are cut out with a fine curved scissors and the under surface smeared on a clean glass slide.] When very numerous acid-fast thin bacilli, especially if in bundles, and red granules are found, they are certainly lepra bacilli, smegma bacilli being often shorter and thicker and granule forms absent, while tubercule bacilli are very scanty. The different degrees of staining properties are not reliable distinguishing points.

L. R.

i. ROGERS (Leonard). **The Treatment of Leprosy.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 772–790. [United Fruit Company, Boston, Mass.]

ii. BAUJEAN (R.). **Essais de traitement de la lèpre à la Martinique.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 90–97.

iii. DELAMARE (G.) & ACHITOUV. **Echec de l'éparséno dans une lèpre à Wassermann positif.**—*Bull. Acad. Méd.* 1925. Feb. 3. Year 89. 3rd Ser. Vol. 93. No. 5. pp. 141–145.

iv. CAWSTON (F. G.). **Antimony Treatment of Leprosy.** [Correspondence.]—*S. African Med. Rec.* 1925. Feb. 28. Vol. 23. No. 4. p. 87.

v. LAIGNEL-LAVASTINE. **Ostéopathies de morphologie lépreuse chez un tabétique. (Présentation du malade et des radiographies.)**—*Rev. Méd. et Hyg. Trop.* 1925. Mar.-Apr. Vol. 17. No. 2. pp. 64–72. With 5 text figs. [2 refs.]

i. Deals with the same material as the Croonian Lectures of 1924, already dealt with in this *Bulletin.*

ii. The writer records a trial of ethyl chaulmoogrates mainly in 20 lepers in Martinique with improvement of various degrees up to complete clearing up of the lesions. His results confirm those of other workers as to the value of the improved treatment.

iii. In this case of mixed nodular and nerve leprosy eparseno was pushed, so as to produce arsenical rash and other toxic symptoms, without in the least ameliorating the leprous condition.

iv. The writer quotes a letter from a missionary lady in Tanganyika stating that the ulcers in a number of lepers healed under the use of oscol stibium. No information is given as to how long the cases were under observation.

v. Perforating ulcer, with exfoliation of pieces of bone, and atrophy of the digital bones of the foot, as shown by X rays, in a tabetic patient are described; but the absence of anaesthesia or of leprous skin lesions allowed the latter disease to be excluded without difficulty.

L. R.

Banciu (A.). **Sur la survivance de la réagine lépreuse injectée chez les animaux.**—*C. R. Soc. Biol.* 1925. Feb. 27. Vol. 92. No. 7. pp. 529–530.

——. **Sur les propriétés acquises par le sérum des lapins inoculés avec un produit lépreux.**—*Ibid.* p. 531.

Dore (S. E.). **Case of Leprosy.**—*Proc. Roy. Soc. Med.* (Section of Dermat.). 1925. Feb. Vol. 18. No. 4. pp. 30–31.

Riecke (Heinz-Gerhard). **Ueber einen Fall von Lepra tuberosa mit besonderer Berücksichtigung der Histopathologie.** [A Case of Lepra Tuberosa with Special Reference to the Histopathology.]—*Arch. f. Dermat. u. Syph.* 1925. Feb. 9. Vol. 148. No. 2. pp. 448–453. With 3 text figs. [6 refs.]

BERIBERI.

ACTON (Hugh W.) & CHOPRA (R. N.). **The Problem of Epidemic Dropsy and Beriberi.**—*Indian Med. Gaz.* 1925. Jan. Vol. 60. No. 1. pp. 1–18. With 8 graphs & 3 plates. [22 refs.]

The authors' proposition is that epidemic dropsy and beriberi are different clinical aspects of a syndrome caused by ingestion of toxins formed usually in damaged rice, but occasionally in dried fish, tinned provisions, etc. Clinically this syndrome may be compared with that of asthma, where a toxin of varied origination may cause extremes either of bronchial spasm or of bronchial turgescence. If the asthma analogy be pursued, then the factors here to be considered are the nature of the poisonous bases begotten in different rices (for there are numerous different varieties and grades of rice), the condition of the nerve-endings affected by these poisons, and the endocrine defence.

The nature of the poisons has been carefully studied by microscope and by pharmacological and bacteriological methods here fully described. Briefly, the poisons are most readily formed in rices which, after having been deprived of their vitality by parboiling and of most of their aleurone and other protectives by excessive milling, are then badly stored in a humid and warm atmosphere where they are attacked (particularly at the exposed and vacant site of the embryo) and damaged by fungi and bacteria, and particularly by a strongly proteolytic bacillus of the *vulgatus* group. Some of the toxins thus developed are water-soluble and affect the heart, besides producing bronchial constriction and swelling of a limb, experimentally; others are alcohol-soluble and have no effect on respiration or blood pressure, but are neurotoxic. The development of toxins in rice through the agency of fungi and bacteria is compared with the formation of ergotin in rye parasitized by the Claviceps fungus [but the comparison is not quite exact]. It is not quite explicitly emphasized, but it is clearly implied in the detailed account given of the different varieties and "grades" of rice, that the respective amounts of water-soluble and alcohol-soluble toxins differ in these different grades; so much so that those (damaged) grades in which water-soluble toxins predominate are termed "epidemic dropsy rice," and those in which alcohol-soluble predominate, "beriberi rice." Epidemic dropsy occurs among Bengalis, who are accustomed to eat medium grades of rice which are invariably parboiled and milled; also in Hindu widows, who consume the water, rich in the soluble toxins, in which rice has been boiled. The Chinese in Calcutta, who eat the harder, coarser grades of polished rice, are sufferers from beriberi.

Damaged rice can be recognized by its opacity, which is exaggerated if the grains be left for a few minutes in water; sections under the microscope show liquefaction and the existence of spores and bacilli in the starch granules. The bacilli have been cultivated by the authors and the poisonous rice-bases produced and studied in the laboratory, the alcohol-soluble poisons (neurotoxic) appearing only under anaerobic conditions, and when the temperature of the medium is raised to 50° C.

Individual susceptibility to these toxins of course exists, susceptibility being increased by hypo-adrenia (and to a less extent by hypo-thyroidism) as has been ascertained by experiment on animals.

The authors' attitude to the vitamine-deficiency theory of the diseases in question is not equivocal, but is expressed with vexatious ambiguity. They believe almost as heartily in vitamins as they do in rice toxins, and they surmise that the vitamins act either by stimulating endocrine secretion or by antagonizing the toxins, since they find by an experiment that rice-polishings contain bases antagonistic to the bases found in diseased rice.

As regards prevention of these diseases they indicate: (1) Detection of diseased rice, in areas affected, by the water test used by rice-merchants, *i.e.*, appearance of opacity when the suspected grains are soaked in water for a few minutes; (2) proper preservation and storage; (3) careful washing of rice before use, to get rid of at least the water-soluble toxins. For curative treatment: (1) Changing the rice; (2) small doses of adrenalin, intramuscularâ, to diminish cell permeability and to antagonize the water-soluble toxins.

[The authors' conclusions, while affording a compact or comity between the theory of BRADDON and that of vitamine-deficiency, have the merit of explaining a lot of clinical incongruities and inconsistencies with all previous theories, and, beyond all that, the merit of being open to the final test of confirmation, or otherwise, by experiment in the laboratory.]

A. Alcock.

DUTT (Kartic Ch.). **Epidemic Dropsy.**—*Indian Med. Rec.* 1924. July, Aug., Sept., Oct. & Dec. Vol. 44. Nos. 7, 8, 9, 10 & 12. pp. 198–201; 237–242; 259–265; 299–302; & 362–364.

This paper is based mainly on observation of 1,700 cases of epidemic dropsy. It contains some excellently discriminative clinical classifications of the disease and some ingenious argument relative to its causation.

The author does not accept either the food deficiency or the food toxin theory. In his own experience neither the use nor disuse either of polished rice or of any description of mustard oil has had any effect upon either the incidence or the treatment of the disease; moreover, in all the recent epidemics in Bengal, villages have suffered where the people decorticate their own rice, as daily required, by their own ancestral domestic methods, and among such sufferers he knows of a well-to-do family whose diet included plenty of fresh fish and fresh vegetables.

On the other hand, he believes the disease to be a malady quite distinct from beriberi, and to be a manifestation of intestinal sepsis dependent on the presence of a specific microbe, for the following reasons: (1) Throughout its course there is a leucocytosis which diminishes during convalescence and ceases on recovery; (2) a Dr. CHAKRAVARTY was infected in the act of operating upon a sufferer from the disease (although Colonel MEGAW, who inoculated himself with 3 cc. of serum from another patient, observed no reaction); (3) the disease is immediately checked and ultimately cured by a powerful antiseptic in the form of colloidal gold solution in nascent chlorine [susceptibility to direct attack by antiseptics has not so far been the story in conditions of generalized sepsis].

The peculiar susceptibility of Bengalis—even among a mixed population outside the limits of Bengal—which tells so strongly against the infection theory, is easily explained by the author. Mainly as the result of a spurious bookish education, of recent introduction, the modern Bengali has so degenerated from the immemorial standards of his stalwart ancestors that he can no longer resist even this particularly feeble microbe.

A. A.

BLACKLOCK (B.), PEACOCK (W. H.) & WOOD (John Y.). **Appendix V.—Investigation into the Health of Prisoners in Freetown Gaol.**—*Sierra Leone Ann. Med. & San. Rep. for the Year 1923.* pp. 55–61.

The seasonal appearance of beriberi is shown in the following table :—

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1922 ...	—	—	—	—	—	1	1	2	8	26	7	14
1923 ...	5	3	2	1	4	2	1	—	—	—	—	—

The disease disappeared in 1923 just at the period when it normally begins to increase. The largest percentage of deaths (3 out of 59 cases) occurred in those who had been in the prison between 7 and 12 months. 834 men were in for short sentences, under six months, a period too short for definite symptoms to appear. It was shown that the incidence of disease (mostly beriberi) and the death rate were higher among convicts than among the gaol prisoners, falling most heavily, as previously reported, on those of sedentary occupations, particularly tailors. The prophylactic measures recommended in 1922 appear to have been effective.

P. W. Bassett-Smith.

NORMET (M.). **Une épidémie de béribéri dans un bataillon Malgache à Granville.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 896–898.

An epidemic of beriberi occurred in the detachment of the regiment while at Granville during September, 1924. After a few isolated undiagnosed cases there were, on September 20th, 93 cases, of which 6 were severe and 3 died ; the epidemic ended in the middle of November, having affected 118 persons. It was traced to a defective diet, for when this was modified (the rice being suppressed and bread given in its place) there was a rapid diminution of the cases. The author finds it difficult to attribute the epidemic to a deficiency of vitamin B.

P. W. B-S.

HOFMANN (J. Allen). **Beriberi in Chinese Women and its Relation to Childbearing.**—*China Med. Jl.* 1924. Dec. Vol. 38. No. 12. pp. 987–993.

Experience during the past few years had led the author to believe that beriberi is more frequent during the child-bearing period than at other times, and is especially serious when it develops during pregnancy. 38 cases were recorded in two years, all in residents of Canton ; 21 were among the poor, 7 from the middle class, and 3 among the wealthy ; 68 per cent. were between the ages of 21 and 35. The observations favoured the view that rice deteriorated from long storage was a cause and that wet seasons were an important factor. Many of the cases showed an acute onset, which is unusual in deficiency diseases. The gastro-intestinal symptoms were attributed to a duodenitis.

P. W. B-S.

RIDLEY (H. W.). **Use of Iodine in Beriberi.**—*Jl. Trop. Med. & Hyg.* 1925. Mar. 2. Vol. 28. No. 5. pp. 102–103.

To avoid losing his employees in the Singapore Botanical Gardens, the author took their treatment upon himself, as far as possible, often with the assistance of the local doctor. A number of mild cases of

beriberi were generally present, mostly men who had been in the gardens more than three months before the annual outbreak; the children and women were not affected. Destruction of the "infected" houses and replacement did not prevent fresh cases. Sanitation beneath the houses was enforced. Having been told that the Dutch found iodine internally most efficacious, he gave 5 minims in water. It is stated that in ordinary cases one dose on three days was curative; great relief was given even when the heart was affected. Only two cases died, and this when he was on leave. The treatment was always used, but no statistics are given.

P. W. B-S.

FUNK (Casimir), COLLAZO (Juan Antonio) & KACZMAREK (Joseph). **Composition du régime et vitamine B.**—*C.R. Soc. Biol.* 1925. Apr. 3. Vol. 92. No. 12. pp. 997–998.

This work is in support of the previous contention that vitamin B plays an important part in the utilization of carbohydrates, which has been doubted by some. Four groups of pigeons, 4 in each, were kept on a diet containing 1·5 per cent. of white of egg, starch and necessary salts. They received varying quantities of vitamin B to establish a constant weight. The initial food was replaced by others containing 25, 50, and 75 per cent. of white of egg. The results showed that the augmentation of the protein content had a favourable influence upon the weight of the bird, and increase of starch had the contrary effect. It is concluded that the exchange of protein necessitates a less quantity of vitamin B than exchange of carbohydrates, or, a definite quantity of vitamin B allows an animal to utilize more of a ration rich in proteins than one in which starch is abundant.

P. W. B-S.

BERNARD (P. Noël). **Avitaminose et infection dans la maladie expérimentale du porcelet due à** *Bacillus asthenogenes.* **(Recherches sur le béribéri.)**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 65–76.

The experiments and deductions previously reported are again brought forward and developed by the author; a discussion took place in which M. WOLLMAN and GUÉRIN spoke.

According to the author, that the disease is due to fermentation and not to vitamin B deficiency is shown by the fact that when whole rice heated so as to destroy the vitamin is used there is no disease in the piglets, but the disease develops when polished rice alone is given. To WOLLMAN it is not certain that the heating in the experiments had been sufficient to destroy all the vitamins, for it is unlikely that the animals would be quite unaffected upon a vitamin B free diet. This view was contested by GUÉRIN, who had been a collaborator with Bernard and had tested the temperature in bulk; he showed that the whole mass became heated to 135° C. and the claim of Bernard was justified.

P. W. B-S.

BERNARD (P. Noël) & BABLET (J). **Lésions histologiques des organes dans le béribéri humain.**—*C.R. Soc. Biol.* 1925. Mar. 7. Vol. 92. No. 8: pp. 600–602.

On the assumption that the *B. asthenogenes* produces a condition of beriberi in animals the authors sought to determine if the pathological lesions of human beriberi were similar to those of experimental animals. The material was taken from six acute and from four chronic cases that died in acute crises. They note punctiform haemorrhages and lymphocytic infiltration in the stomach and duodenum, congestion and hypertrophy of liver and spleen, inflammatory lesions of the kidney and suprarenal capsules with haemorrhages, the lesions indicating the irritative action of some toxic substances. [These changes are very similar to those found by HAMILTON WRIGHT, but the present authors do not record any changes in the cerebrospinal system or nerves.]

P. W. B-S.

BERNARD (P. Noël) & BABLET (J.). **Lésions histologiques des organes dans le béribéri infectieux expérimental du à** *B. asthenogenes.*—*C. R. Soc. Biol* 1925. Mar. 13. Vol. 92. No. 9. pp. 668–670.

Three methods of infection were employed: (1) Ingestion of infective germs by piglets; (2) intraperitoneal or subcutaneous injection of piglets, which died or were killed; (3) the intravenous injection of toxin into rabbits, which died in less than three hours. The resulting lesions were identical in all; death was therefore considered to be due to intoxication, but the lesions in the stomach and duodenum were more marked after the injection of the toxin than in the feeding experiments. The pathological changes found show a striking analogy between the human beriberi and the experimental infective beriberi due to *B. asthenogenes.*

The pure toxin of *B. asthenogenes* produces the same lesions as found in the experimental disease of gastro-intestinal origin due to the infective germ.

P. W. B-S.

PETRI (Else). **Histologische und histochemische Befunde bei experimenteller Beriberi.**—*Virchows Arch. f. Path. Anat. u. Physiol.* 1924. Vol. 253. No. 1/2. pp. 147–156. [26 refs.]

The observations were made upon the organs and tissues of rats, mice, and fowls, in which beriberi was experimentally induced. Many efforts have been made to demonstrate histological and pathological changes specific to the disease without much success. The author's rats and mice were divided into three groups: (1) Some with typical beriberi; (2) some with the chronic form; (3) mixed material from Prof. HOFMEISTER. Previous observations were to a large extent verified, except that evidence of fatty degeneration of the heart muscle, kidney and liver was rare. In the suprarenals the neutral fats were within physiological limits. The observations on the hypertrophy of the suprarenal of hens did not confirm those of OGATA in rice disease of birds. From the whole series of experiments the author concludes that there were no regular pathological features, and the changes found are not specific but occur in all cases of disease due to insufficiency and malnutrition.

P. W. B-S.

BERNARD (P. Noël). **Action pathogène de** *Bacillus asthenogenes.*—*C. R. Soc. Biol.* 1924. Dec. 12. Vol. 91. No. 35. pp. 1245–1246.

This contains nothing new. The author states that the results need to be interpreted with great circumspection in the study of beriberi, but suggests the possibility of the rôle of *B. asthenogenes* in the evolution of the disease.

P. W. B-S.

i. KOBAYASHI (Yoshiwo). [**On the Results of Water and Condensation Experiments in Edematous Beriberi and on Water Intermediate Metabolism.**]—*Nissin Igaku* (*Progress in Med.*). 1924. Sept. Vol. 14. No. 1. [Summarized in *Japan Med. World.* 1924. Dec. 15. Vol. 4. No. 12. pp. 331–332.]

ii. MATSUMOTO (Shigewo). [**Blood Features in Human Case of Polished Rice Disease.**]—*Keio Igaku* (*Jl. of Keio Med. Soc.*). 1924. July. Vol. 4. No. 7. [*J. M. W.* p. 335.]

iii. ITO (Hisayoshi). [**On Vitamin B Contents of the Organs of the Rabbit fed with Various Different Rations with a Contribution to the Knowledge of Beriberi-like Disease of the Rabbit.**]—*Osaka Igakkwai Zasshi* (*Jl. of Osaka Med. Soc.*). 1924. May. Vol. 23. No. 5. [*J. M. W.* Vol. 4. No. 11. p. 294.]

iv. TOGUCHI (Katsuta), OKAMOTO (Kyotaro), HIRAISHI (Teiichi), OHTA (Kenichiro) & KWA (Fuki). [**On Experimental B-Avitaminosis on Human Body.**]—*Keio Igaku* (*Jl. of Keio Med. Soc.*). 1924. July. Vol. 4. No. 7. [*J. M. W.* Vol. 4. No. 12. p. 335.]

v. SHIBATA (Yasaburo). [**Observations on Vitamin B Deficiency in the Dog, with Special Reference to the Changes in the Gastric Juice.**]—*Igaku Chuo Zasshi* (*Central Jl. of Med.*). 1924. Aug. Vol. 22. No. 3. [*J. M. W.* p. 330.]

vi. TAGAWA (Zentaro), HARA (Katsumi) & OHMORI (Seiichi). [**Contributions to the Knowledge of Beriberi.**]—*Okayama Igakkwai Zasshi* (*Jl. of Okayama Med. Soc.*). 1924. Aug. No. 415. [*J. M. W.* p. 338.]

vii. SHIMAZONO (Junjiro). [**Comparison of Beriberi and B-Avitaminosis.**]—*Kyoto Igakkwai Zasshi* (*Jl. of Kyoto Med. Soc.*). 1924. July. Vol. 21. No. 7. [*J. M. W.* p. 336.]

viii. FUKUI (Shinritsu). [**On the Respiratory Oscillation of Intra-Rectal Pressure of the Cases of Beriberi and other Diseases.**]—*Chugwai Iji-Shimpo.* (*Internat. Med. Jl.*). 1924. Sept. Vol. 43. No. 17. [*J. M. W.* pp. 328–329.]

ix. KOZAWA (Shyuzo), KUSUNOKI (Michiwo) & HOSOTA (Nohfu). [**On the Vitamin B Contents of the Beriberic Urine.**]—*Iji Shimbun* (*Med. News.*). 1924. Dec. No. 1153. [*J. M. W.* 1925. Vol. 5. No. 2. p. 40.]

x. TAKAKUSU (Ryochyo). [**On the Saccharification of the Urine of Beriberic Cases.**]—*Iji Shimbun* (*Med. News*). 1924. Aug. No. 1146. [*J. M. W.* Vol. 4. No. 12. p. 329.]

xi. OHTA (Kenichiro). [**Urine Analysis and Metabolism in Human Experimental B-Avitaminosis.**]—*Keio Igaku* (*Jl. Keio Med. Soc.*). 1924. July. Vol. 4. No. 7. [*J. M. W.* p. 335.]

xii. IJIRI (Matagoro). [**On the Therapeutic Action of Strychnin Hydrochlorate with Special Reference to its Action against Perceptive and Motorial Disturbances in Beriberi.**]—*Chugai Iji Shimpo.* (*Central Med. Jl.*). 1924. Nov. Vol. 43. Nos. 21 & 22. [*J. M. W.* 1925. Vol. 5. No. 2. pp. 37–38.]

i. No definite changes were observed. The urine condensation carried out by the kidney was normal, as also was the excretory function.

ii. The blood experiments in human experimental "polished rice disease" never showed hyperglycaemia, acidosis, or decrease in lymphocytes, but rather an increase of the latter cells.

iii. Animals were fed upon foods containing different amounts of vitamin B, and the organs were tested quantitatively for the vitamin. It is concluded that in hyper- and hypo-vitaminosis the equilibrium of acid and alkali in the body was good, but in beriberi-like disease there was a marked acidosis.

iv. From the authors' experiments with a number of robust young persons fed upon vitamin B deficient diet they conclude that polished rice disease does not completely agree in its symptoms with beriberi. Various forms of derangement of nutrition appear to be caused by lack of B vitamin.

v. Shibata observed a quantitative decrease of HC1 content in the gastric juice of the experimental dogs, which was independent of the anaemic condition of the animals.

vi. The authors found that there was an increased bilirubin excretion in the urine of a large percentage of cases of cardiac-oedematous forms of beriberi.

vii. Shimazono states that, clinically, cases of beriberi and experimental human B avitaminosis resemble one another closely, except that in the latter there is loss of appetite and less disturbance of the circulatory system. The relations of the two are similar to those of Basedow's disease and experimental hyperthyroidism.

viii. Fukui found that the respiratory oscillation of the intrarectal pressure in beriberi cases was less marked than in the normal or in other diseases than beriberi.

ix. Using Van der WALLE's method, the authors found that the polished rice disease of pigeons was not relieved by the administration of the component parts of urine of cardiac beriberi cases, but was relieved by those of normal urine. This might mean that the former was deficient in vitamin B, whereas it was present in the latter.

x. Takakusa states that the saccharification(?) of the urine of beriberi cases, especially when severe, was markedly reduced—even to one-half or one-third of that found in normal urine.

xi. Ohta carried out numerous tests from cases of various forms of B. avitaminosis which he divides into four groups, but no definite conclusions are given.

xii. It is stated that strychnine relieves incomplete paralysis, but has no action when it is complete. In beriberi it had the power to relieve disturbances of perception and motion. The sensory nerves were more quickly affected than the motor. The deduction is that other substances than vitamins can be employed for cure in beriberi.

P. W. B-S.

DUTT (Kartick Chunder). **Prognosis of Epidemic Dropsy.** (Bengal Beri-Beri.)—*Indian Med. Rec.* 1925. Mar. Vol. 45. No. 3. pp. 77–78.

SCURVY.

SCHAGAN (B.). **Zur Klinik des Skorbutes im Kindesalter.** [Scurvy in Children.]—*Jahrbuch f. Kinderheilk.* 1924. Feb. Vol. 104. No. 3/4. pp. 225–238. [7 refs.]

This is a very interesting paper with many tables analysing the results of a study of 186 cases of scurvy in children. The incidence was highest between the sixth and eighth year, the prognosis better for girls than boys and during the summer than in the autumn. Twenty out of 30 fatal cases were studied on the post-mortem table; they showed a very high percentage of pulmonary complications (30 per cent.) coming next to subperiosteal haemorrhages (40 per cent.).

The lack of vitamin C is looked upon as the etiological factor, but the constitution of the patient determines the course and severity of the disease. It generally takes the character of a severe toxic condition with many organic changes causing a high mortality. It tends to make a pre-existing tubercular infection in children more active. The study of the blood and X-ray examinations point to severe disease of the bone marrow. There is not the physiological gain in weight of the normal child and the renal efficiency is reduced. Protein therapy by serum, milk, etc., failed entirely, and up to the present there is no specific therapeutic treatment. Dietetic treatment with vegetables and raw milk rich in C factor gave good results in many cases; 1 per cent. copper sulphate was the best application to the diseased mucous membranes.

P. W. Bassett-Smith.

STILL (G. F.). **The Treatment of Infantile Scurvy.**—*Proc. Roy. Soc. Med.* (Sect. of Therapeutics & Pharmacol.) 1925. Apr. Vol. 18. No. 6. pp. 9–15.

This paper from a practical teacher of great experience in the scurvy and prescurvy condition of infants is of much interest. The author very truly states that the vitamin theory has done little so far to help, for it has long been recognized that particular fruits and foods are essential in treatment and prevention, and BARLOW gave very definite instructions with regard to their use both for prevention and cure. He roundly condemns most patent foods and preparations, and points out how little antiscorbutic there is even in unboiled cow's milk. He finds "potato cream" to be one of the best antiscorbutics for infants; lemon juice, orange juice, and tomato juice are all, however, very good, but are inclined in certain cases to set up diarrhoea, a very undesirable complication. He acknowledges the work done by biochemists, particularly ZILVA, in decitrating the juice and then concentrating, thus making it less irritating to the bowel. "Dried milk is not protective against infant scurvy, but it is far less likely to cause scurvy than any of the patent foods." He points out that the infants themselves may vary much in their reaction to antiscorbutics; what is good for one is not for another; and that the more exact results obtained with guineapigs do not "come off" in the infants. Often, however, the failure is due to insufficient dosage or supply of the vitamin C. Very definite directions are given which should be of great value to the clinician.

P. W. B-S.

SSOKOLOFF (N. A.). **Ueber Cholesterinämie beim Skorbut.**—*Deut. Arch. f. Klin. Med.* 1924. Oct. Vol. 145. No. 3/4. pp. 236–239. [2 refs.]

The author examined the blood of 23 cases of scurvy divided into three groups: (1) Severe cases under good conditions; in these there was a great reduction of the cholesterin content of the blood. (2) Severe cases which were ill-nourished and under bad hygienic conditions; in these the fall was more marked, even to half the normal. (3) Convalescent cases; in these the amount gradually rose to normal. The low percentage had no direct relationship to the amount of fever or loss of weight, but was thought to be due to toxic agents. The cholesterin content was always reduced in scurvy blood and in proportion to the severity of the case; this low content must not be looked upon as an etiological factor, but rather as a result of the disease.

P. W. B-S.

ZILVA (S. S.). **Recent Progress in the Study of Experimental Scurvy.**—*Proc. Roy. Soc. Med.* (Sect. of Therapeutics & Pharmacol.). 1925. Apr. Vol. 18. No. 6. pp. 1–9. With 6 charts.

Previous experimental work on the etiology of scurvy and the effects of storage on antiscorbutic preparations is reviewed. The effects of oxidation, the aerobic and anaerobic preservation of vegetable juices (fruits and roots) are shown by experimental curves, and the methods employed by the author to obtain the active factor in greatest purity possible are described, viz., by removing acids and sugars and finally precipitating with lead acetate. There remains a very active fraction which contains very little nitrogen and merely traces of phosphorus, decolorizes pot. permang. and reduces ammoniacal silver nitrate in the cold. Diffusion experiments show that membranes which pass small molecules, such as sod. chloride, retain the antiscorbutic factor during a period of 3-4 days of dialysis. Those membranes that pass semicolloids, such as neutral red, allow the antiscorbutic factor to dialyse. Therefore, the antiscorbutic factor is not associated with the sugar and probably is not derived from the nitrogenous fraction of the juice.

P. W. B-S.

MOURIQUAND (G.), LEULIER (A.) & MICHEL (P.). **Fluctuations du fer sanguin au cours du scorbut expérimental.**—*C. R. Acad. Sci.* 1925. Jan. 5. Vol. 180. No. 1. pp. 86–88.

The known pathological changes of the blood in scurvy led to a chemical examination in experimental animals and attention was concentrated upon the iron content. The results obtained in different periods of the disease were both definite and interesting. There was little change from the normal up to the 24th day; the iron content then became constantly lowered and appeared to run parallel with that of the haematin. The cause of the changes, anaemia, etc., was recognized by the authors in the haemorrhages that take place and in all cases the fall followed the development of the scurvy symptoms; with the cure of the disease it disappears.

P. W. B-S.

i. MOURIQUAND (G.), LEULIER (A.) & MICHEL (P.). **Avitaminose C et glycémie.**—*C.R. Soc. Biol.* 1925. Feb. 6. Vol. 92. No. 4. pp. 271–273. [1 ref.]

ii. ——, ——, & ——. **Dosage du phosphore et de la chaux du tissu osseux et des dents des animaux soumis à l'avitaminose C.**—*Ibid.* pp. 269–271.

i. In previous experiments with avitaminosis in guineapigs the authors showed that there was a marked reduction of iron in the blood after the 24th day. Fresh experiments were made to determine whether there was any change in the amount of blood sugar. Six animals and six controls were used. The ratio in the blood remained remarkably constant and in acute conditions of vitamin C deficiency of guineapigs there was no evidence of abnormality, the tests and controls agreeing closely throughout.

ii. In this series of experiments, made to determine the changes in the bones, etc., of animals under conditions of vitamin C deficiency, it was shown that, contrary to the anatomical and chemical evidences, there was neither decalcification nor dephosphorization of the bones in scurvy guineapigs, even when the fragility of the bones was very marked. The cause of this fragility has still to be discovered, and further research on this point is being carried out.

P. W. B-S.

BEZSSONOFF (N.). **Quelques données sur la nature du principe antiscorbutique dit Vitamine C.**—*C. R. Acad. Sci.* 1925. Mar. 23. Vol. 180. No. 12. pp. 970–972. [3 refs.]

This paper is highly technical. By a process of oxidation the author was able to obtain from fresh cabbage juice a crystalline substance in alcohol and acetone. This product protected guineapigs from scurvy when given in quantities of less than 2 mgm. It is a hydrocarbon belonging to the orthodiphenol group. The oxidation of this gives a quinone which seems to be "phenol anthracénique."

P. W. B-S.

DELF (Ellen Marion). **The Influence of Storage on the Antiscurvy Value of Fruits and Vegetable Juices.**—*Biochem. Jl.* 1925. Vol. 19. No. 1. pp. 141–152. With 2 figs. [12 refs.]

The present work is a continuation of that started in 1918 by DAVEY and others, in part at the Lister Institute. For the experiments young guineapigs were used (350 gms.), the fruit juice was fresh and the period of observation 90 days. No attempts were made during the storage to exclude air so that considerable oxidation would have taken place. The following conclusions are given :—

"1. When whole fruits (oranges or lemons) or tuberous roots (swedes) are stored, their antiscorbutic value is retained as long as the tissue itself remains living.

"2. The expressed juice of oranges and lemons stored for five years in the frozen condition retains about half its original antiscorbutic potency. Swede juice on the other hand stored in a similar way, loses the greater part of its value in less than two years. It is suggested that the greater deterioration in the latter case may be due to the lower acidity or to autoxidation or to both.

"3. Canned orange and tomato juice retain much of their value even after storage for four years at laboratory temperature. The tomato, as prepared for these experiments, was much less stable than the orange.

"4. Lemon juice, with added potassium bisulphite, retains its flavour well after storage for 4½ years at laboratory temperature. At this age, the protective dose of lemon juice containing ·06 per cent. sulphite was about 10 cc. instead of the original 1·5 cc., thus indicating a loss of about five-sixths of the original value.

"5. Both orange and lemon juice can be preserved satisfactorily for one to three years at laboratory temperature in presence of their own rind oil.

"6. Inspection of the comparative curves in fig. 1 shows the relative stability of the juices examined. Canned orange is the most stable, and this is in agreement with previous findings with heated juices [Delf, 1920]. The frozen juices are next in order of stability; the form of the curves in preserved juices suggests that the added sulphite has a destructive effect on the stability of the antiscorbutic vitamin."

P. W. B-S.

MACKLIN (A. H.). **Lime Juice and Lemon Juice for Prevention of Scurvy.** [Correspondence.]—*Brit. Med. Jl.* 1925. Apr. 4. p. 680.

From practical experience in the war and in Polar regions Macklin draws attention to the frequency of prescurvy conditions, and states that the lemon juice supplied, though effective, was not easily portable. He suggests that much further use might be made of the "tablet" method of BASSETT-SMITH, "the value of which cannot be doubted for use in military campaigns, or where relief is required for destitute populations, or for cruises such as that of the *Discovery*." The trouble is to get these concentrated preparations manufactured by firms. He states that their adoption by the Admiralty or War Office would benefit not only members of the Services, but many outside.

[There is no doubt that concentrated forms of lemon juice in a portable form would have a great field of usefulness both in the Service and mercantile marine, and also among children (STILL, page 589).]

P. W. B-S.

BASSETT-SMITH (P. W.). **Lime Juice and Lemon Juice for Prevention of Scurvy.** [Correspondence.]—*Brit. Med. Jl.* 1925. Feb. 21. p. 385.

This story has been told in the *Bulletin* before, but bears retelling. Following the treatise of LIND (1754), BLANE, in 1796, caused lemon juice to be established as an essential part of the naval dietary; with the result that scurvy was practically abolished. About 1860, for an unknown reason, West Indian limes were substituted for Spanish lemons, with disastrous consequences to NARES's expedition (1875). Recent work proves abundantly the superiority of lemon to lime juice. The writer, to provide a portable substitute for lime juice, evaporated lemon juice *in vacuo* and made tablets each containing the equivalent of half a lemon; these were protective to guineapigs after a year's storage. We may with confidence apply the use of concentrated lemon juice to man under conditions of service which preclude the regular provision of fresh fruit, such as in the Persian Gulf and in high latitudes. For general service on a large scale the unheated concen-

trated syrup may be kept in bottles and the equivalent of 24 cc. of fresh lemon juice given to each man with sugar in water. Such syrup keeps well, being immune from mould. The reason for the letter appears in the last sentence where we learn that the Admiralty still issues lime juice "as an agreeable beverage," but supplies no anti-scorbutic capable of replacing lemon juice.

A. G. B.

HARA (Saburo). [**Experimental Studies on C-avitaminosis.**]—*Chugai Iji Shimpo.* (*Central Med. Jl.*). 1924. Oct. Vol. 43. No. 20. [Summarized in *Japan Med. World.* 1925. Feb. 15. Vol. 5. No. 2. p. 37.]

In his experiments with vitamin C deficiency diets the author did not find any definite sign in mice and pigeons; in 10 per cent. of the rats there were slight evidences. In guineapigs there were marked signs which he divides into three stages. In the first two stages the administration of vitamin C caused an almost instantaneous cure; in the third stage it was not effective.

P. W. B-S.

GITTINGS (F. C. B.). **Lime Juice and Lemon Juice for the Prevention of Scurvy.** [Correspondence.]—*Brit. Med. Jl.* 1925. Mar. 7. p. 483.

REVIEWS AND NOTICES.

McCarrison (Robert) [C.I.E., M.D., I.M.S., in Charge of Deficiency Diseases Inquiry, Indian Res. Fund Assoc., Pasteur Inst., Coonoor] & Norris (Roland V.) [D.Sc., Agric. Chemist to Madras Govt., Agric. College, Coimbatore.] **The Relationship of Rice to Beri-Beri in India.**—*Indian Med. Res. Memoirs. Supplementary Series to the Indian Jl. Med. Res.* 1924. Oct. Memoir No. 2. pp. 1–87. With 3 maps and 6 charts in text. [29 refs.]

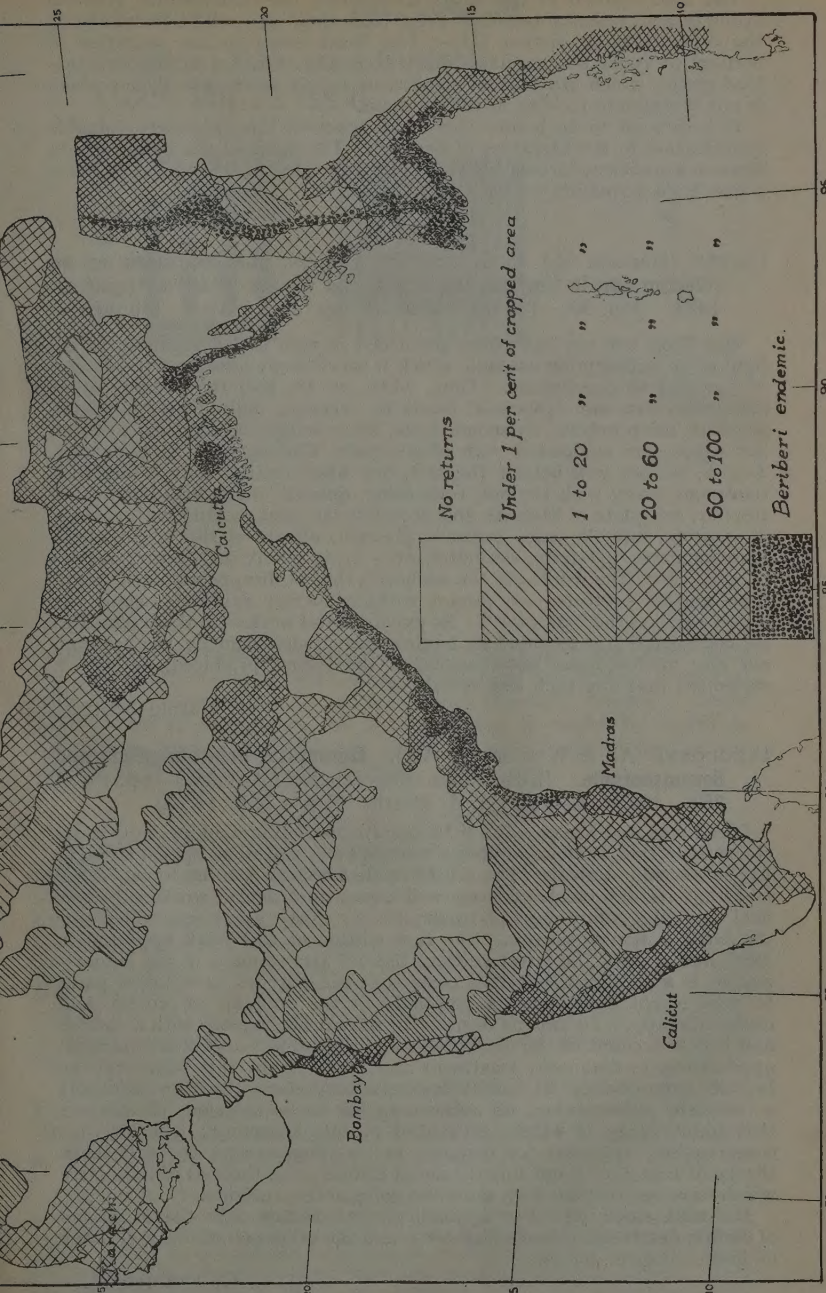
The basal idea of this memoir is to indicate "the extent to which present-day views in regard to the association of endemic or true tropical beriberi with the too exclusive use of a rice diet require modification in so far as India is concerned." That such an enquiry is needed is obvious when it is remembered that though decorticated rice is practically the staple diet of many millions in India beriberi is endemic only in a few circumscribed areas of Bengal and Assam, the north-east coast of Madras, the coast of Burma and the valleys of the Irrawaddy and Salween rivers. The question, too, is of more than academic interest, since suggestions have been made as to the advisability of legislation dealing with the over-milling of rice.

The work falls almost naturally into four sections, and the results can best be appreciated when thus considered. Under section I a full account of the milling of rice is given, and comparisons are made between the methods obtaining in beriberi and non beriberi areas. Many factors are discussed, such as the storing of rice, the use of other vitamin foods in the diet, the value of food-grains other than rice grown in endemic areas of the disease, etc. The result of these investigations seems to show that "unknown factors, peculiar to, or more potent in, endemic areas of beriberi appear to possess an important significance in regard to the genesis of this disease."

Section II deals with the source, variety and description of the paddy and rice investigated, samples of which were taken from two areas, viz., the Kistna district, where beriberi is very prevalent, and the Tanjore district, where the disease is not present. These districts are both formed by the deltas of great rivers and, moreover, have different rice-milling methods.

Experimental investigations with the samples of rice just described constitute section III of the memoir. It is impossible even to mention the 22 results given in the summary. Perhaps the fact that pigeons fed exclusively on Indian rice are liable to suffer from one of three different kinds of polyneuritis is worthy of special note. 1. *Polyneuritis Columbarum,* due solely to vitamin B deficiency. 2. *Beriberi Columbarum,* due to insufficiency, but not complete lack, of vitamin B, together with the presence of an unknown substance having a specific action on the heart. This disease is associated with "polyneuritis, large heart, enlargement of the liver and adrenal glands and hydro-pericardium, with or without generalized oedema." 3. *Infective polyneuritis.* This is merely an infection, the liability to which depends upon vitamin B deficiency. The authors expect to find a similar difference in the etiology of human beriberi-like polyneuritis. One variety of rice investigated, which was known to be productive of human beriberi, gave rise to beriberi columbarum, while 27 other varieties were found to be non beriberi-producing, though most of them caused polyneuritis columbarum. These results are of great interest and importance.

Section IV of the memoir deals entirely with chemical analyses of the various rice samples. The percentage of phosphoric acid in a given rice is a fairly reliable indicator as to its vitamin B content, and to its power of curing or preventing polyneuritis columbarum, yet it is not reliable with regard to the cure or prevention of human beriberi in endemic areas. "A rice which contains over 0·4 per cent. of phosphoric acid may be associated with beriberi columbarum in the laboratory or with human beriberi in endemic areas of this disease, while a rice which contains less than 0·4 per cent. of phosphoric acid often forms the staple article of diet in localities where the disease is unknown."



Map of Central and Southern India showing the wide distribution of rice-growing districts compared with the narrow tracts of country in Burma, Bengal, and on the North-East Coast of Madras where beriberi is endemic.

[After Figs. 1 & 3 in *Memoir No. 2, Indian Medical Research Memoirs*, 1924, October, (McCarrison & Norris).]

The final opinion of the authors regarding the fundamental question in the present research may best be given in their own words, found among the conclusions to section III—"The basal factor in the causation of beriberi in India is a fundamentally poor diet, whether of rice or other food grains, which provides an insufficient supply of vitamin B, but which is not completely lacking in this vitamin."

It is difficult to do justice in a small space to this extremely valuable contribution to the literature of beriberi. The name of the senior author alone is a sufficient incentive to all those interested in the subject to make a first-hand acquaintance with the memoir.

A. Douglas Bigland.

CASTEX (Mariano R.) & GREENWAY (Daniel). **Le entozoosis en su relación con la toxemia intestinal**—*La Prensa Médica Argentina.* 1925. Jan. 30. 112 pp. With 10 figs. on 2 plates. [30 refs.]

This book will not have been published in vain if it is regarded in the light of an outstanding example which it unwittingly affords of the danger of jumping to conclusions. Thus, when we are told that among other symptoms flatulent dyspepsia, headache, vertigo, daily fever, lumbago, pruritus, amenorrhoea, dysmenorrhoea, muco-sanguineous stools, to name but a few, are associated with Blastocystis, Chilomastix, *E. histolytica*, *E. coli*, we can well believe the fact, but when further we are told that treatment orally with thymol, turpentine, quinine, methylene blue, salol, sulphur, salicylate of bismuth and neosalvarsan, and rectally with enemas of creosote, salicylic acid, benzene, glycerin, nitrate of silver, potassium permanganate, iodoform, dermatol, etc., bring about satisfactory results in some cases [the words are the authors'], that is, disappearance of symptoms and of protozoa, we cannot without further evidence regard the "post hoc" as the "propter." No experimental work with these parasites (or commensals) is recorded as having been undertaken by the authors, nor any microscopical observations of the lesions produced, or even a statement that any such lesions existed.

H. Harold Scott.

DIEUDONNÉ (A.) & WEICHARDT (W.). **Immunität Schutzimpfung und Serumtherapie.** (Elfte, stark umgearbeitete Auflage.)—pp. vii + 250. 1925. Leipzig: J. A. Barth. [Price Rm. 11.70]

Dieudonné and Weichardt's little handbook of Immunology, now in its eleventh edition, is an admirable one of its kind, and must appeal strongly to the German student. The source of that appeal is to be found in the fact that its authors have been well-known and active workers in this field since the palmy days of twenty-five or thirty years ago, which saw the birth of a new science. The first edition of this work appeared in 1895, and in this, the latest edition, the old arrangement of the subject-matter is maintained, but it is clear that the authors have taken pains to note recent developments especially in the domains of protein- and chemo-therapy. To anyone desiring to refresh his memory with a concise and logical account of the development of the subject and of its practical applications in diagnosis, treatment and prophylaxis, this book may be heartily commended. It has its defects nevertheless. It is by no means a complete vademecum; its authors appear to be oblivious of the fact that immunology is widely cultivated outside Germany; yet its very conservatism, apparent for instance in its allegiance to the side-chain theory of EHRLICH, is not unwelcome at a time when theories of immunity which have served their day, are undergoing active revision.

The book closes with two appendices, one dealing with the technique of certain outstanding serological tests, and the other containing a glossary of immunological terms.

J. C. G. Ledingham.